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ABSTRACT

The study examines military manpower procurement for peacetime. It considers the broad alternative systems of conscription and voluntarism and develops models of demand and supply for military labor to show how these are affected by the choice of procurement system. Empirical applications are made using evidence from Australia, Canada, Great Britain, and the United States. Evaluation of the alternative systems in the peacetime context is made in terms of allocative efficiency, distributional effects, adjustment flexibility, and issues of social control. Although the budget cost of a volunteer force is usually greater than that of a drafted one, it was found that a peacetime draft of a professional standing military would impose real economic costs not present in the volunteer system. The volunteer force would better serve the distributional criterion of equity and could be supplemented by a draft for reserves, possibly lottery, and a stand-by draft for major expansion. In general, findings favored an all-volunteer recruitment for active duty in peacetime. Appendixes tabulate and identify data. (Author/MDW)

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THE POLITICAL ECONOMY OF MILITARY MANPOWER PROCUREMENT IN PEACETIME

A thesis presented
by
Glenn Alexander Withers
to
The Economics Department
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CHAPTER 1. INSTITUTIONAL AND HISTORICAL BACKGROUND

> "Everyone will now be mobilised, and all boys old enough to carry a spear will be sent to Addis Ababa. Married men will take wives to carry and cook. Those without wives will take any woman without a husband. Anyone found at home after receipt of this order will be hanged."
>
> Emperor Haile Selassie of Ethiopia, 1935.

In that best of all possible worlds there would be no warfare and hence no need for national armies. In our world the fact of war and standing armies must be taken as given. Each nation feels that its only protection against other nations is to arm adequately. The irony is that this very military preparedness only makes war all the more certain, and all the more devastating when it occurs. We are caught in a system of international irresponsibility for which the only evident long-term solutions are national disarmament and the establishment of an effective world political order.

For the present, resort to military force to advance national interests and to settle international disputes will continue, and even those nations which see themselves as most disposed to the pursuit of peace will feel it necessary to maintain standing military forces for self-defense. The concern of this dissertation is with how these standing armies are raised.

In many countries the military is one of the largest single industries. In the U.S., for instance, over seven percent of GNP has continued to be allocated for defense even since Vietnam, and the defense establishment in 1973 employed almost 3 4 million people on a full-time basis.

Only six states in the U.S. have a greater number of working people than the armed forces.

Such a major component of the nation's economic life would seem worthy of the professional attention of economists. Yet the military is much neglected, as for instance in the textbooks which introduce economics to the student.[1] While there are various reasons for this neglect, undoubtedly a major factor is that military institutions and purpose do not seem to lend themselves very readily to the competitive market approach of conventional economics.

Markets and Bureaucracy

Defense is not a good provided by private profit-seeking producers to be purchased through commercial exchange by individuals for their private consumption. It is rather a public good generating a collective benefit not appropriable by single individuals, and one provided by a bureaucratic monopoly organization in an amount decided by a political process.

Our interest is in the military as a manpower institution, and it follows that the demand for military labor correspondingly is not one derivable by private producers from market demand for the product of that labor, but is, instead, one derived by government administrators in meeting the defense demands emerging from the political process.

The supply of military labor is similarly removed from the market in two important ways. The first is that

the nature of job skills - with a high element of specific non-transferable skill acquired over a period through formal and on-the-job training in a structured job progression sequence - and the presumed national security requirement for control and availability of those skills, have established an "internal labor market" within which pay and training and allocation of labor are governed by administrative rules and procedures rather than free response to market prices.[2.]

Exit from this labor market is thus carefully regulated and hiring takes place exclusively at a small number of specified points, each at the bottom rung of a highly structured promotion ladder. Most jobs are closed to outside hiring and are filled only by a well defined internal job movement pattern. Market contact is maintained only at the entry and exit points, where attraction and retention is determined.

Moreover even at the entry point, the military labor system may still be removed from market influence by a second factor viz. the power of conscription. Apart from the minor fellow exception of jury service, the military is the only employment for which a labor levy is now commonly imposed. In a 1970 survey, Roy Forward found that eighty-five countries used compulsory military service.[3.]

Because of these institutional features, the military labor system presents a significant contrast with the

private competitive labor markets pictured in standard economic theory. The divergence is well illustrated by considering the classic proposition of competitive micro-theory that employment equilibrium for the firm will obtain with marginal wage cost equal to marginal revenue product of labor.

For the military employer, however, there is no sales revenue, marginal physical product is difficult to define even conceptually, the military manager is not constrained to profit maximizing behavior, the wage may not be a market wage due to the operation of a draft, and the specificity of training and its mutual benefit to both employer and employee means that the wage level is, within a range, indeterminate anyway.

Reflecting these divergences from private competitive labor market patterns, are the unique conditions of employment of the military. The requirements for socialization, control and ready availability and return on specific skills, have meant a total commitment to service life by military personnel including a fixed term of engagement, liability for 24 hour service availability, closeness to service life outside of normal working hours, frequent reposting movement, inability to resign, strike or negotiate over working conditions, and subjection to military discipline. All of this is associated with the frequently trying working

conditions and the dangers and risks inherent in both military training and actual operations.

Some of these conditions of employment are to be found in civilian life. But this is infrequent, and the total combination of conditions is nowhere nearly approximated, a fact which has in turn led to the traditionally paternalistic military pay structure, replete with such features as a large part of pay being received in allowances or non-cash form (food and housing), with different payments to married vs. single personnel. The philosophy is one of need rather than contribution to national defense, a view also reflected in the limited differentiation of compensation across skill groups, and in the large proportion of compensation received as deferred (retirement) pay.[4.]

This dissertation, however, does not review all aspects of the military labor system. Rather it seeks to focus on what has been the publicly most contentious element of the system - the use of conscription for military service.

Conscription is a topic that generally has not been well served by scholarship. The wide range of issues involved and the depth of public feeling on the question, have not matched well the scholar's propensities for narrow specialization and presumed objectivity. To meet

these difficulties we have felt it useful here to broaden the approach to that of "political economy" and give deliberate attention to some of the political factors and value considerations involved in the problem where these can be elucidated by economic analysis.

Naturally the extended topics so chosen, and the treatment afforded them, reflect the biases and values of the writer. But to expect otherwise would be foolish. "Objectivity" does not mean "value-free" enquiry. It means rather that value assertions should be recognized and labelled as openly as one's awareness of them permits, that alternative viewpoints be recognized and fairly considered, and that one's approach be reasoned and analytical rather than assertive and emotional. This is an approach that is not at all incompatible with conviction and concern, and it is therefore the approach we have attempted to follow here.

In analyzing the choice of military manpower procurement systems, we confine our attention to the situation of peacetime, or limited war, military labor needs only. One reason for this is that good data could be obtained for these situations. More importantly, though, the administrative advantages of conscription for large scale mobilization are more readily conceded, and the equity and liberty objections to a draft are less weighty, in the presence of a clear and substantive danger to the nation -

though this does not say that conscription will still not be controversial for other reasons in this situation, as, for example, Australian and Canadian experience during World Wars I and II shows.

International Comparisons

A second delimitation is that we will be primarily concerned with the experience of two countries: the United States and Australia, both of which have recently turned to all-volunteer forces after considerable public debate over their experience with Selective Service and National Service, respectively, in the 1960's. For further comparison, frequent reference will also be made to the experience of Canada and Britain, both of which have now maintained all-volunteer forces for some time--though Britain after a period of conscription in the 1950's.

In the Australian and American draft debates, frequent reference has been made to overseas practice. In Australia the Prime Minister Sir Robert Menzies defended National Service by asking: "How could we possibly take up the attitude that whereas conscription for military service might be all right for allies and protectors, it was no good to us, for local political reasons?"[5] The Gates Commission in the United States examined foreign experience "to anticipate problems which might arise once the draft was ended in the United States."[6]

We have restricted the comparison in this study to Canada, Britain, the United States and Australia, since

foreign experience is likely to be most meaningful for a group of countries with similar cultural circumstances. Each of these countries is an industrially developed democracy with a mixed free enterprise economic system and a population of predominantly British origin and traditions, with comparable styles and standards of living. Tables 1.1-1.3 outline the relative defense expenditures, their distribution and associated manpower for the four countries.

Of course, overseas experience cannot be directly transplanted, and comparisons must be made with the utmost care, making full allowance for the crucial differences in local circumstances which will remain no matter how carefully the countries are chosen for their similarities. The diverse historical experience of Canada, Britain, the U.S., and Australia with conscription certainly indicates the importance of these unique circumstances, as a brief survey of that history illustrates.

Of the four countries Canada has been the most strongly attached to the all-volunteer principle. Since Canadian regular forces were first established in 1871, conscription has been adopted only twice: in October 1917 for the duration of World War I and in 1940-45. Even in these two instances volunteers continued to provide the great bulk of Canadian service manpower. In World War II, of the 1,086,771 Canadians who served all but 100,573 were volunteers.

TABLE 1.1. DEFENSE EXPENDITURE, 1970-1973

Country	GNP	Defense Budget						
	$ billion	$ million		Per Capita $	Percentage of GNP			
	1970	1972	1973	1972	1969	1970	1971	1972
United States	976.4	83.4	85.2	399	8.4	7.4	7.5	7.2
Canada	82.6	2.0	2.1	90	2.4	2.4	2.0	1.9
Britain	121.5	7.0	8.7	12.5	5.0	4.9	4.5	4.6
Australia	32.8	1.6	1.7	12.1	4.2	3.9	3.9	3.6

TABLE 1.2. DEFENSE EXPENDITURE BY FUNCTIONAL CATEGORY, 1972

Functional Category	USA		CANADA		BRITAIN		AUSTRALIA	
	$m	%	$Cm	%	£m	%	$Am	%
Compensation	35,812	49.7	1,329	63.6	1,224	45.2	606	49.8
Maintenance	12,239	17.0	548	26.2	343	12.7	379	31.1
Total Current	48,051	66.7	1,877	89.8	1,567	57.9	985	80.9
Procurement	16,347	22.7	127	6.1	674	24.9	140	11.5
R & D	6,488	9.0	49	2.4	307	11.3	50	4.1
Other Capital	1,177	1.6	35	1.7	159	5.9	43	3.5
Total Capital	24,022	33.3	211	10.2	1,140	42.1	233	19.1
Total	72,073	100.0	2,088	100.0	2,707	100.0	1,218	100.0

TABLE 1.3. DEFENSE MANPOWER, 1973

Country	Regular Armed Forces (Incl. Conscripts)	Civilian Defense Personnel	Trained Reservists	Total Men of Military Age (i.e. 18 - 45)	Percentage of Regular Forces to Men of Military Age
United States	2,252,900	1,132,900	927,400	38,700,000	5.8
Canada	83,000	40,100	23,200	4,500,000	1.8
Britain	361,500	323,900	435,000	10,800,000	3.3
Australia	73,330	51,300	32,300	2,600,000	2.8

Source: International Institute for Strategic Studies
The Military Balance, 1973-74

Canadian participation in the Korean War and in other U.N. peacekeeping operations has been all-volunteer. Since 1963 recruitment has been to a single unified military service numbering a little under 85,000 in recent years - a reduction from a higher level of 100,000 in the late 1960's. The reduction in force size reflects the strategic assessment made public in the White Paper on Defense, 1971.

Undoubtedly a major factor underlying Canadian manpower procurement policy has been the problem of a French-Canadian minority, which forms one-third of the population and which has traditionally resisted conscription for fear of being compulsorily involved in wars related to separate anglophone interests. According to Colin Gray it is for this reason that "conscription has remained one of the ugliest and most divisive words in the Canadian political lexicon. The gravest threats to the political integrity of Canada in this century arose out of the conscription crises of 1917, 1942 and 1944".[7]

In Australia, compulsory militia-type training has been quite common but, as with Canada, conscription for regular service with the permanent forces has been relatively rare and attempts to implement such schemes have been invariably controversial. In World War I, the government appealed twice to the electorate for the power to conscript for overseas service, and was twice rejected in referenda. Only volunteers served. Similarly, for

World War II, only volunteers served in the regular forces overseas, though in 1943, after considerable debate, liability for service in the South-West Pacific was extended to the conscript militia forces. In 1964, a scheme of conscription into the regular forces, using a lottery draft, was instituted, and this remained in operation until 1972, since which time there have been all-volunteer forces. The Australian forces now number 74,000 (1973), a reduction from the 1970 peak of 86,913, reflecting Vietnam withdrawal and the Labor government reassessment of the earlier "Forward Defense" strategy.

The dominant influence in the history of military manpower procurement in Australia has been the ideological opposition of the Australian Labor Party to compulsory military training and, even more, compulsory service overseas. This opposition has been such that few other public questions have matched the conscription crises of 1916-17, 1943 and 1964-72 for their bitter and divisive impact upon Australian society.

British experience with conscription has been less acrimonious. For most of its history, in fact, the British military has been a professional force, with conscription sometimes applied for the territorial militia. It was only with the emergencies of World War I and II that conscription began to be used for regular service, and from 1945 to

1960 a National Service scheme continued to supplement voluntary military enlistment. Since 1960, the armed services have returned to exclusive reliance upon voluntary enlistment. The transition was associated with the 1957 re-evaluation of defense strategy, which saw Britain deciding to cut back on its international military commitments, and moving to strengthen its nuclear retaliatory power. This strategic switch away from conventional forces meant a deliberate strength reduction from 690,000 in 1957 to 375,000 by 1962. Today the forces number around 362,000 (1973).

There has been more resort to conscription by the United States than the other three countries - despite the legacy of a New England threat of secession from the Union during the War of 1812 over the issue of conscription, and the bloody New York draft riots of 1863 which left more than 1,000 dead in street fighting. Thus in both World War I and II comprehensive draft laws were enacted and provided the bulk of military manpower. Indeed in 1918, voluntary enlistments were forbidden for the remainder of the War. After a short lapse following World War II, Selective Service was revived in 1948 and continued in operation until 1973. Selective Service provided a significant proportion of the manpower for the Korean War and for Vietnam. The adoption of all-volunteer forces followed U.S. combat troop withdrawal from Vietnam in 1973, and was associated with

the Nixon strategic reassessment defined in the "Guam doctrine," restricting U.S. ground force involvement in Asia. The military forces now total 2.25 million (1973), which is down from the Vietnam peak of 3.55 million, and 450,000 less than the 1964 pre-Vietnam strength. The draft machinery is retained on a stand-by basis.

Despite the similarity of the recent trend to fully volunteer forces in the four countries, the divergent historical backgrounds clearly give rise to caution in drawing strong conclusions. The importance of particular strategic circumstances, for example, suggests we should avoid grand declarations of the sort "that we are witnessing the end, or at least the transformation of the mass army" (Gwyn Harries-Jenkins).[8] But equally we must not lose sight of the advantages to be gained by supplementing direct analysis with alternative insights. It is clear that such comparisons are going to continue to be made, so that it is better that, at least, the analogy be as informed as possible. Citation in the past has often been highly selective and impressionistic. Besides, provided foreign experience is not treated as more than suggestive, we can seek solace in Boulding's First Law: "If it exists, then perhaps it is possible."

Procurement System Alternatives

A third delimitation of the study is to focus on the institutional choice between all-volunteer forces and draft systems of the Australian lottery or U.S. Selective Service

type. These were the systems actually in operation in the four countries in the past fifteen years, and the systems for which we therefore have some reasonable evidence. Other draft systems will be occasionally alluded to, but no systematic evaluation will be presented. The further basic (and heroic) assumption is that, in the four countries to be considered, the practical political choice now actually comes down to one between all-volunteer forces or a draft of the lottery or Selective Service type.

We thus put aside discussion of such fringe alternatives as unilateral disarmament and civil resistance,[9] as well as such more frequently proposed alternatives as universal conscription or national service. Because of their more common advocacy though, we should turn to these latter two briefly. Universal conscription can be instituted in two forms: universal military training, or universal military service in the regular forces. The main advantage of both forms is the apparent improvement in equity, with wide-spread sharing of military burdens. The main disadvantages are inefficiency, and interference with individual freedom -- the social and economic disruption being larger for universal conscription for regular service. The question becomes one of whether the balance of advantages is such as to justify such a draft in time of peace or limited war. The economic burden usually decides against universal conscription for the permanent

forces in these times, and whether the alternative militia training arrangement is justified will depend closely upon the likelihood of a massive territorial invasion. This readily explains the reliance of neutral nations such as Switzerland, Finland, Sweden or Yugoslavia upon extensive militia arrangements. For the four countries we will investigate however the need for territorial and non-alliance defense seems small at present, and the consequent demand is for a smaller professional military with standing forces available for overseas service and to provide and maintain the framework for future expansion. Accordingly we put aside direct investigation of universal military training and service.

This disposition conforms to the deliberate limitation already placed on this study to consider only the manpower procurement system appropriate to a peacetime standing professional military force. The military here considered is specifically one which aims at keeping the officer, senior enlisted and skilled specialist structure intact, supported by sufficient general enlistment to enable the force to practise and advance the military arts, to meet "brush fire" and "small-war" needs from the established resources, and to provide the manpower nucleus, equipment and organisational structure for expansion in the event of a threat of larger scale hostilities. How that expansion itself might be accomplished and sustained, whether by reserves or new enlistments and whether by draft or volunteer recruitment, is

considered - but it is not the focus of the greater part of the study, which restricts itself instead to the standing peacetime military.

An alternative which can meet the strategic requirement of a professional standing force, without excessive military call-up, is a national service scheme covering civilian as well as military service. And the idea of an additional commitment of the youth of the nation to the eradication of disease, poverty and ignorance in our own society and elsewhere is exciting and worthy. Unfortunately the element of compulsion is still involved and for a non-national defense requirement. Thus the system is a costly means to its praiseworthy end. Youth compelled to serve will not be uniformly willing and enthusiastic and, however strongly committed will not be appropriately trained, capable and competent for many of the tasks required. If the service is valuable and important enough to merit public action, then better that the relevant trained, dedicated and professional personnel be employed and the scheme financed openly through general taxation.

But these are arguments that can only appear superficial, presented so briefly in advance of the text. It is believed that the framework of the argument to be advanced can be readily extended to these alternatives. But each of the possibilities is simply a variant of a conscription system and the key question will be whether any form of compulsion is necessary in situations short of significant mobilisation.

In the following chapters, we look first at the question of whether the fiscal implications of a draft predispose a democracy toward maintaining conscription in peacetime rather than turning to an all-volunteer force. This is the subject of Chapter 2. Finding the adoption of a draft not a foregone conclusion, Chapter 3 looks more closely at the process of determination of military manpower needs and how personnel requirements will differ under draft and volunteer regimes. The complementary analysis of supplies forthcoming under alternative regimes is put forward in Chapter 4 and a matching with the demand analysis permits specification of the feasibility conditions for an all-volunteer force. Beyond feasibility lies desirability, the subject of Chapter 5 which evaluates the procurement alternatives for this peacetime situation. The criterion examined in detail are those to which economic analysis can best contribute: allocative efficiency, distribution, flexibility, though a discussion of further criteria less well-analysed by economic methods but essential to a balanced view of the issues in analysing this controversial area, rounds out the study.

CHAPTER 2. FISCAL POLITICS AND CONSCRIPTION

> Economists setting out to elucidate political problems by wielding nothing but their own tools are likely to stumble. Fortunately their very stumbles can turn out to be illuminating.
>
> Albert Hirschman, A Bias for Hope, 1971

Our primary concern in this study is with supply behavior under alternative military manpower procurement systems. However, we do need to consider military labor demand insofar as it relates to the choice between the alternative supply institutions of conscription and volunteerism.

In conventional economics the demand for labor is analyzed for profit-maximizing firms producing a definable output and operating in competitive markets. For the public good "defense," demand for labor must relate to an ill-defined output produced by a bureaucratic non-market organization in response to politically expressed demand for the product.

Two phases for analysis of military manpower demand can therefore be distinguished: the political process phase in which collective demand and funding for defense policies are determined, and the bureaucratic phase of providing output to meet that collective demand. We wish to examine these two phases as they relate to the issue of

choice of military manpower procurement institution.

To examine the bureaucratic determination of military manpower requirements we take the collective choice of defense demand and funding as given, and assume that this is not influenced by the choice of procurement institution.[1] It is then the task of the bureaucracy to establish the military manpower strength appropriate to this demand[2]--and this will be affected by the procurement institution. The next chapter is devoted to this bureaucratic phase as it relates to the draft and volunteer alternatives.

What we examine first is the collective choice phase, not in the choice of level of defense, but rather in the choice of procurement system itself. Whether a conscription or volunteer force is adopted is a political, not bureaucratic, policy decision and economic analysis has been employed to outline factors felt to be crucial to this choice.

An Economic Model of Institutional Choice

As is analyzed in detail in Chapter 4, conscription is an implicit tax-in-kind imposed as insufficiently compensated labor for servicemen (both volunteer and draftee) which thereby generates a subsidy to the general (non-service)

taxpayer in the form of a smaller general explicit tax levy necessary to fund a given military establishment.

From this fact a number of economists have concluded that conscription is frequently adopted and maintained in a democratic regime because voters will follow their fiscal interest and support an institution, (the draft), which eases the tax burden of the majority. Greene and Newlon, for instance, state that "Certain economic considerations explain why the draft may be preferred by a majority of citizens ... We conclude that a major barrier to a volunteer army may be the inability of those who would benefit from eliminating a draft to compensate those would would lose."[3] Galbraith too has maintained that "The draft survives principally as a device by which we use compulsion to get certain young men to serve at less than the market rate of pay. We shift the cost of military service from the well-to-do taxpayer who benefits by lower taxes to the impecunious young draftee."[4]

The most fully developed presentation of this argument is that given by R. D. Tollison.[5] We choose to use the Tollison model to examine this process of institutional choice. It is to be shown that the economic interpretation of the draft is too simplistic and that isolation of economic factors under ceteris paribus assumptions, an approach that often serves well in other

contexts, is inappropriate and misleading. A more complex alternative model must be adopted.

Tollison's basic assumptions are:

1. A political system of direct (referendum) democracy with a simple majority voting rule and universal suffrage.
2. The adoption of a military draft is the only issue to be decided.
3. Individual voting is based on pecuniary self-interest (discounted expected wealth).
4. Budget savings associated with a draft are recognized, and not lost through inefficiencies engendered by conscription and are not used to increase public expenditures by equal or greater amount.

We have then a model of pure economic men operating in a Swiss democracy with full perception of the fiscal ramifications of a draft system. Whether or not a draft is adopted by the collectivity thus depends in this simple (Tollison) model upon the size of the military manpower demands in relation to total voting population and on the form of the draft system being considered for adoption.

The form of the draft system is relevant because some systems may not permit advance determination of liability and acceptability for service. For example if a lottery system is proposed the impact of conscription will be the expected implicit tax effect discounted by the probability of

being drafted. Voting against the draft will thus be based on the size of the group eligible for the draft ballot rather than the actual number of inductees.

If we do assume prior knowledge of service obligation or if we treat a lottery draft as the viable alternative so that a constant parametric relationship holds, then the determining factor behind collective choice of military manpower procurement institution in this model is simply the magnitude of military manpower demands. Provided servicemen and prospective inductees constitute less than half of the voting population a draft will be instituted. On the principle that "bygones are bygones," veterans will behave as do other general taxpayers and vote to support a draft since this is now to their fiscal advantage too.

This analysis, Tollison feels, "lays bare the political elements that underlie a draft system in a democracy ... The inference is that something like this choice process explains the existence and stability of real world draft systems."[6] A pecuniary minded group of non-military individuals, when they form a voting majority, is thus seen as enacting a draft system to ease their tax burden.

But it is really a very large step from recognizing the distributional implications of the draft, and even assessing it as one factor in voting on the issue, to claiming that it is for this reason that drafts are adopted

and maintained.

What the model essentially predicts is that where there are more general taxpayers than servicemen a draft will be enacted. The basic mechanism is the assumption of pecuniary motivation and the institutional constraint of majority rule. But this is a prediction that is neither substantial nor sound.

Rarely are there situations where the military is strictly larger than the non-military voting population. Moreover in those situations where the size of the military does become relatively large--as in a citizen soldier system along Swiss lines or with mass mobilization--it seems a sound general rule that the greater the manpower requirements the more likely a resort to the draft.

Indeed it is a second prediction of the model that a draft will tend more to be adopted for small military establishments and abandoned for large scale military forces. Clearly such a model misses much--for while conscription is adopted in many countries even for relatively small military establishments it is rarely abandoned in times of greater military manpower demand. Similarly it has been the historical experience of each of the countries considered in this study, as outlined in Chapter 1, that it is return to smaller military manpower strengths that has preceded the adoption of all-volunteer forces. This is the opposite of what the simple Tollison

model would predict.

Another prediction of the model would be that it is the military which will oppose conscription and civilians who will favor a draft. But here the most that can be said is that the record is quite mixed. It may be possible, for instance, to discern a predominant bias in favor of the draft on the part of the U.S. military establishment since World War II, but the opposite seems true for the military in Australia, Britain and Canada.[7] The civilian record is equally mixed with national referenda in Australia consistently rejecting a draft while public opinion polls in the U.S. show a steady majority favoring conscription. Canadian public opinion polls have, at different times, found both majority support and opposition to compulsory military service.[8]

A simple causative explanation of conscription in terms of majority fiscal exploitation of a minority seems ruled out. The problem is much more complex and the attempted generalization is unsuccessful. We review the model's simplifications to find the reason for predictive inadequacy and we suggest an alternative model.

Political Environment and Voter Motivation

Part of the Tollison model's lack of success could come from the model's assumptions as to political environment. Modification of the assumptions of universal suffrage,

direct democracy, simple majority rule, single issue concern and true perception of fiscal interests could all alter the predictions of the model. Thus young men of draft age or facing the draft in the near future may be voteless, so altering the voting balance there. The representation process and length of election period can produce divergence between citizens' preferences and politicians' decisions.[9] Multi-issue elections can permit coalition formation, so that an enfranchised draft-age group feeling very strongly about conscription may face a non-intense majority, sufficient elements of which may be willing to trade a vote against conscription for support on another issue.[10] Another possibility is that voters may not fully recognize the tax implications of the institutional choice since the conscription tax is an implicit tax-in-kind.

But it can be shown that it is not the political environment assumptions that are the basic problem. We can show this in an empirical manner because we do have some political situations which conform to the simple political environment postulated in the model and yet the predictions of the model are still not confirmed. With the exception of the suffrage element one example of such a system is the Swiss system of continuing public referenda. Even more applicable is the Australian referenda experience of 1916-17.

Facing a need for reinforcements for its volunteer divisions in Europe but being blocked from enacting conscription legislation in Parliament by a hostile Upper House, the Australian Government chose to put the question of conscription to the electorate in a referendum in October 1916. This direct appeal for powers of compulsion was defeated. A second attempt to gain those powers by referendum, in December 1917, was also defeated.

The experience is important for our purposes because the conscription proposals related to men aged 18 to 35--not just disenfranchised young men, they were voted on by direct referenda employing a simple majority voting rule,[11] and the conscription issue was the only issue put to the electorate in the referenda. The size of the anticipated call-up was made clear to the electorate and meant, even allowing for those in a potentially draft-vulnerable status as opposed to actual numbers to be called, that the vast majority of voters knew they could not be conscripted. Yet the civilian majority voted against the draft and a separate count of service votes showed that a military majority voted for the draft. This voting pattern is the exact reverse of that predicted by the Tollison model and the divergence clearly cannot be accounted for by the political simplifications of the model.

The difficulty then must lie with the remaining simplification of the model viz. the assumption of voting based on

pecuniary self-interest. We question the validity and usefulness of this assumption here and we propose instead an alternative conception of voter behavior, incorporating non-pecuniary variables and recognizing that the interest of others figures prominently in the utility calculations of many individuals.

The need for such an alternative approach is crucial for conscription because it should be clear that the draft is not just another tax. It is compelled labor where an individual is required to turn from his normal pursuits to adopt a military life with all its disciplines and dangers. Certainly compulsion is involved in other taxes too. But compulsory military service is crucially different in that here the state requires not just subjection but servitude and, unlike the minor fellow exception of jury service, it requires a major servitude involving a large commitment of oneself, and the possibility of killing and being killed in the name of one's country.

It is not surprising that decisions about the adoption of such an institution should involve a whole range of factors. Voting on the issue thus derives from a complex of motives ranging from solicitude ("I don't want my son to get killed.") to retribution ("I had to do it, so should you."), and from paternalism ("It will make a man out of you.") through pacifism ("Thou shalt not learn to kill."),

to patriotism ("Your country right or wrong"). The scope here for important non-pecuniary variables to influence voting is clear and the role of interdependent utilities may well become pre-eminent for many in influencing decisions on conscription.

Such traumatic historical episodes as the New York draft riots of 1863, the Australian conscription plebescites of 1916-17 and the conscription crisis in Canada in 1917, 1942, and 1944, all indicate an importance attached to this issue that is rare for purely fiscal considerations. It is apparent that any mono-causal explanation of conscription is bound to be superficial at best and incorrect at worst--a point that might seem obvious were it not for the growing literature on the draft in economics which seems content to propose unqualified theories of fiscal exploitation in this field. The assumption of pecuniary motivation is, of course, conventional in economic analysis and fundamental to deductive economics. If individuals act in an erratic fashion, only statistical methods will serve to discover laws of human action.[12]

But with assumption of predictable behavior we face two problems. One is that our motivation assumptions must be operational--capable of independent verification. Too many writings use postulates of utility maximization that are simply tautological, useful as a framework for organizing

thoughts but not productive of testable scientific predictions. By assuming wealth maximization in the collective choice model a quite operational assumption was made and predictions from the model could be derived and tested, both in principle and fact, against evidence.

Making such a specific assumption of motivation brings the investigator face to face with the second problem; even if individuals act in a purposive way they may do so from a large number of complicated motives. Model building may still proceed if it is thought that a basic or most common or a significant motive can be isolated and examined for its effects. But it must be established and not merely asserted or assumed that the motivation chosen has indeed the importance claimed. This may be shown by direct testing of motivation, say through experimental or survey methods, or by testing the predictions of the model employing the assumption, and attempting to allow for the separate effects on prediction of the other important simplifications of the model.

The latter course is the one that we have been implicitly following in this chapter. The conclusion reached is that a number of basic predictions of the model are not confirmed and that, while more complicated assumptions as to the political environment can provide reasons for divergent predictions, the model is still not verified even in

circumstances where the simplifications of political environment are appropriate and accurate. Interdependent utilities and important non-economic variables influencing behavior in voting on this issue are said to be the major cause of these deficiencies.

Further Empirical Evidence

Further evidence or this is provided by the available poll data on the draft. For Britain a search of Roper Survey Research Center computerized records found no questions asked on conscription by any major survey organization since the file commencement date of 1966. For Canada the first time a question was asked on compulsory military service since 1956 was on September 7, 1974. As indicated earlier, more of the sample opposed than favored conscription.

The available breakdown of the Canadian survey data is by age and education and the details are given in Table 2.1. The age-related pattern of opinion does conform to what would be expected from the Tollison model. The older age groups are more strongly in favor of a draft, and since income (and hence economic gain from a draft) increases with age, this result is compatible with a pecuniary self-interest motivation. But so are other explanations compatible with this age pattern, for example: a paternalistic desire to use the

military as a vehicle for the personal improvement of today's youth, (providing them with responsibility, discipline, patriotism, and physical strength) would equally explain the result. Moreover the education-opinion relationship is the opposite to what the correlation of income and education would imply for a vote based on fiscal interest. We note though that the question asked deals with a proposal for universal military training, so that opinions may reflect differences of view on the need for that level of military manpower rather than the method of procurement.

For the United States, the only Gallup Poll dealing directly with this subject was conducted on December 30, 1968. The available cross-classification is by age and is given as Table 2.2. Unlike the Canadian case, more respondents supported the draft than were opposed and support was greater among the young, who would suffer the greatest pecuniary loss under a draft. Neither the Canadian nor U.S. poll evidence then sits well with the Tollison type model of draft adoption.

Poll data though is subject to the usual reservations as to whether people say what they believe or do what they say. The sample size is also limited for analyzing specific population characteristics. More direct evidence on this issue can be sought in the voting records for the 1917 conscription referendum in Australia. The circumstances of

TABLE 2.1. OPINION ON CONSCRIPTION, CANADA, 1974

	Favor Draft %	Oppose Draft %	No Opinion %
Age:			
18 to 29 years	24	68	8
30 to 49 years	45	46	9
50 years and over	58	31	11
Education:			
Elementary	55	29	16
High School	42	50	8
University	26	68	6
Total (N=1071)	44	46	10

Question: "Would you favor, or oppose, requiring each able-bodied young man in this country, when he reaches the age of 18, to spend one year in military training and then join the reserve or militia?"

Source: Canadian Institute of Public Opinion, The Gallup Report, September 7, 1974.

this referendum were discussed above, and it will be recalled that a majority voted against conscription. For this referendum we have detailed voting data, though not for the 1916 referendum, and we can relate this to data from the 1911 Census. 1921 Census Reports were unobtainable from U.S. sources.

Since federal electoral districts and census districts did not have common boundaries, we are obliged to restrict analysis to the smallest common unit available viz. metropolitan

TABLE 2.2. OPINION ON CONSCRIPTION, UNITED STATES, 1968

Age:	Favor Draft %	Oppose Draft %	No Opinion %
20 to 29 years	71	26	3
30 to 39 years	69	25	6
40 to 49 years	62	35	3
50 years and over	55	36	9
Total (N=1460)	62	32	6

Question: "After the Vietnam War is over, do you think the United States should do away with the draft and depend upon a professional military force made up of volunteers, or do you think the draft should be continued?"

Source: Roper Public Opinion Research Center, Williams College, Massachusetts, unpublished tabulation, 1974. From American Institute of Public Opinion (Gallup Poll), #773, December 30, 1968

and non-metropolitan sub-division of each state. The socio-economic characteristics available on this basis were age, sex, religion, country of birth, industry and occupation, education. The latter referred only to literacy and so was not used. A measure of the numbers from each region who were serving overseas in the armed forces also was obtainable from the voting return figures.

Ordinary Least Squares linear regressions were applied to the 12 regions using the variables indicated. The results are given in Table 2.3. The inclusion of variables had to be governed by their availability rather than a priori theory,

TABLE 2.3. THE AUSTRALIAN CONSCRIPTION REFERENDUM OF 1917:

CROSS SECTION REGRESSION ANALYSIS

Variable (mean value)	Coefficient (t statistic)		
	Equation 1	Equation 2	Equation 3
Dependent Variable (0.4647)	VOT[1]	VOT[1]	VOT[1]
Military Age[2] (0.5397)	0.0111 (0.056)	-0.0105 (-0.059)	
Female[2] (0.500)	3.064 (3.238)	2.812 (4.363)	2.827 (5.152)
Roman Catholic[3] (0.1923)	-0.3391 (-1.007)	-0.2771 (-1.006)	-0.2747 (-1.088)
Born Overseas[3] (0.1802)	0.1528 (0.393)		
Rural Occupations (Males)[3] (0.3151)	0.5626 (3.149)	0.5092 (4.732)	0.5102 (5.176)
Armed Forces Overseas[2] (0.517)	9.130 (7.480)	9.3778 (9.678)	9.362 (10.856)
Constant	-1.683 (-2.683)	-1.526 (-3.407)	-1.539 (-4.268)
R^2	.9505	.9489	.9489
N	12	12	12

1. VOT = Proportion voting in favor of conscription.
2. Variable as a proportion of regional voting population.
3. Variable as a proportion of regional total population.

Data Sources: Commonwealth of Australia, Parliamentary Papers, (General), Session 1917-18-19, Vol. IV, pp. 1461-1589.
Commonwealth Statistician, Census of the Commonwealth of Australia, 1911, Vols. I and II.

but the variables lend themselves to natural interpretation.

A quite high coefficient of determination for cross-section analysis was obtained, indicating that around 95% of the voting pattern could be "explained" by the independent variables included. The proportion of foreign born and the proportion of the voting population of military age did not contribute significantly to explanation. The latter result is important because in Tollison's own model age is often used as a proxy for fiscal position on the draft issue. The assumption is, with Galbraith, that older well-to-do taxpayers vote to extract subsidies from the impecunious young draftee. This behavioral assumption is not born out by the Australian data.

The variables contributing to explanation of the conscription vote are the largely non-wealth correlated variables of: proportion of women, males in rural occupations, the regional contribution to Australian forces overseas and the proportion of Catholics. The former three variables contribute to a vote <u>for</u> conscription and the Catholic variable contributes to a vote <u>against</u> conscription. The constant term is negative. The coefficient estimates are fairly stable in relation to the omission of the age and birth-place variables.

The pattern of explanation that emerges conforms to the accepted literacy historians' interpretation of the conscription plebescites.[13] The historians have emphasized the

Irish Catholic contribution to the draft debate, where Australian conscription was seen as a tool for use in British trade wars and for exerting imperial control, including over Ireland. They have also particularly emphasized the labor opposition to conscription which was seen as paving the way for industrial conscription or at least for greater wage controls, and is here reflected as the inverse of the proportion of men in rural occupations. The female vote was also emphasized but was not so predictable a priori, since both pro and anti-conscriptionists made strong appeals to women voters. Women were assailed with warnings that "the more men you send the more will be killed!!! Do you want the furnace of war to consume all your fathers, husbands, and brothers? ... Vote No," or they were entreated to "for the sake of the mothers of soldier-sons, vote Yes."[14] In the event, women voted more than proportionately in favor of conscription. The other major explanatory factor isolated was the contribution of each region to Australian volunteer troops overseas. This was a positive influence in voting for conscription, presumably in the belief that conscription would better reinforce and protect the soldiers already overseas. Those soldiers themselves voted, in a separate tally, in favor of conscription.

It is clear that those variables which contribute

significantly to explaining the 1917 conscription referendum vote in Australia are variables reflecting characteristics such as sex, religion, and social class which are little related to pecuniary self-interest considerations and which strongly reflect interdependent utility factors--religious and class solidarity, maternal and wifely concern.

Pecuniary motives, even when isolated in a multivariate analysis, do not seem to contribute significantly to explanation. Moreover even if fiscal self-interest were shown to be important it must be recognised that to isolate that motivation under ceteris paribus assumptions, as we can do with price effects on the choice between apples and nuts, is inappropriate to this case of choice between institutions.

The price effects of a draft inherently represent an institutional change that has crucial non-price implications in the minds of many people. Adoption of conscription not only alters the structure of tax liabilities but at the very same time and by the very same act affects strongly a range of political, social and philosophical beliefs and interests.

A tax-price change here represents not just an incentive to change the amount demanded of a commodity under given institutional arrangements. The tax-price change reflects the very institutional change itself - something

for which, in this area, we cannot simply assume a single given set of tastes for the associated commodity. The institution of provision of the commodity is itself a matter of preferences here. To isolate a pecuniary effect and to raise it to the level of sole causation, claiming it "explains the political origin and stability of the draft"[15] is wrong-headed.

CHAPTER 3. MANPOWER REQUIREMENTS UNDER ALTERNATIVE PROCUREMENT SYSTEMS

> Qui desiderat pacem, praeparet bellum - Let him who desires peace, prepare for war.
>
> Vegetus, De re mil. 3, Prologue (circa 350 A.D.)

It follows from the analysis of the collective choice of procurement system in the previous chapter that a draft to man a peacetime standing army is not a foregone conclusion in a democratic regime, in spite of pecuniary advantages to general taxpayers who form a majority of voters. Many issues, economic and non-economic, will influence decisions. Feasibility and desirability of a volunteer force are thus subjects still worthy of investigation.

To examine feasibility we must define the military manpower requirements necessary to meet defense needs in peacetime, and then assess the conditions under which the alternative procurement institutions can produce the manpower supply to meet these needs.

The remaining task on the demand side is therefore a specification of military manpower requirements. To do this we take the general level of demand for defense services as exogenously given to us by the political process, and consider only the translation of demand for defense into personnel requirements.

Defense Manpower Planning

The determination of how the general level of defense output is to be provided is the responsibility of the bureaucracy that organizes the production of defense services.

It will be recalled that defense is a public good and hence represents market failure. It is a good for which the co-ordinating function of the market fails to operate since its production and distribution are not amenable to response to money flows and prices in markets.

The alternative allocation mechanism to exchanges in the market is that of "command" which refers to resource allocation in physical terms via administrative orders. The command system is a bureaucratic one with cues coming not from the market but from directives in a hierarchic structure. Allocation thus becoms a matter of planning, whether implicitly or explicitly, and it is within this sort of environment that military manpower requirements are determined as part of the process of deciding upon the allocation of resources to meeting a collective demand for "defense."

The elements that enter into defense manpower analysis are outlined schematically in Figure 3.1. The diagram concentrates on flows rather than stocks and so is best interpreted in terms of an ongoing planning operation.

The figure illustrates a basic parallel demand and supply planning sequence and matching process that would be

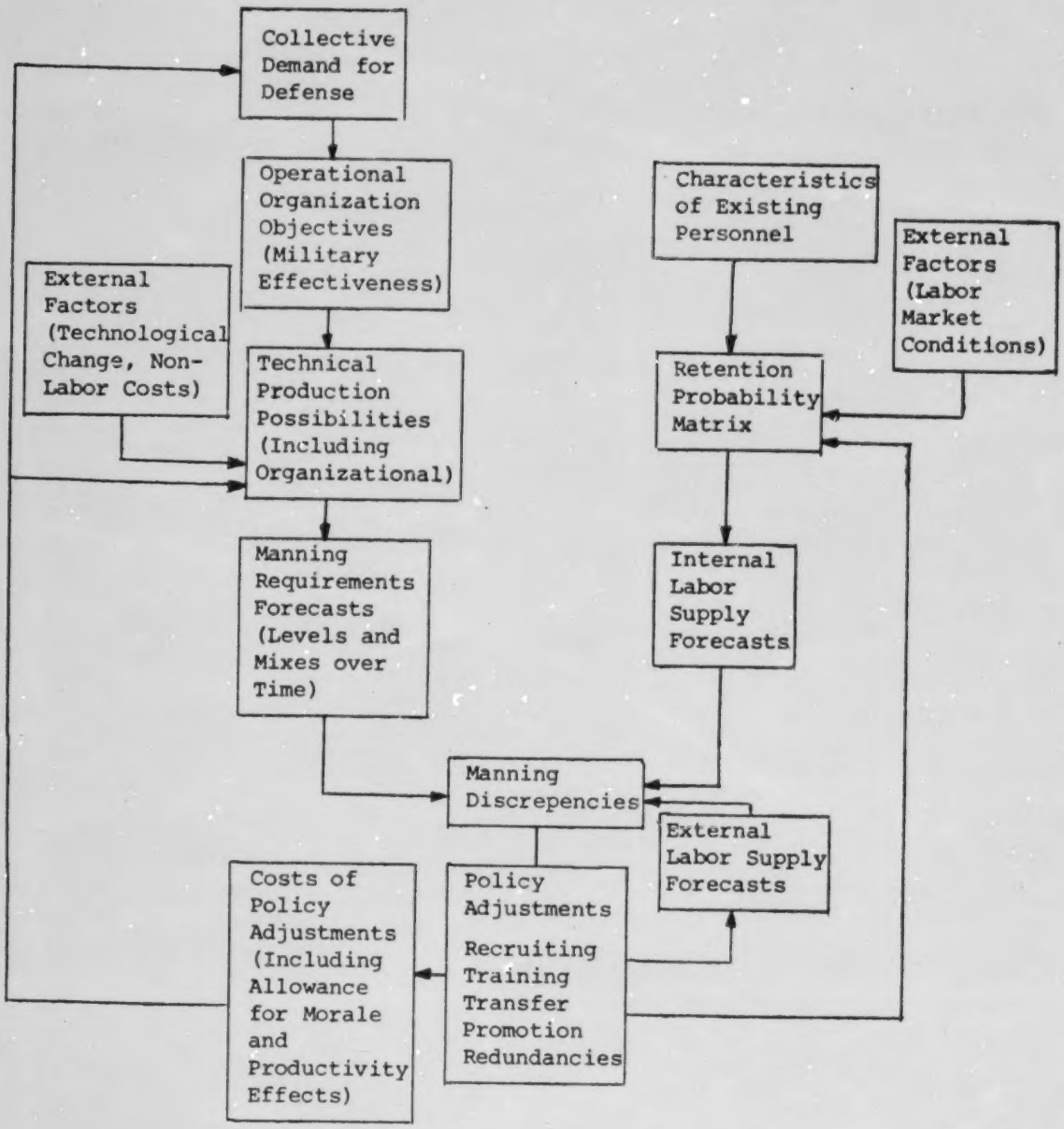

FIGURE 3.1. DEFENSE MANPOWER PLANNING

a bureaucratic equivalent of the automatic operation of those supply and demand forces in the market.

A formal way of analysing the planning process and improving decision-making would be to formulate this manpower system as a programming model. The standard approach here would be to develop in detail what is the supply side of the schema in Figure 3.1, by elaborating the internal labor supply component to show the structure of manning according to such characteristics as rank, length of service and military occupational specialty, and to show how aggregates of people in these various categories flow at various rates and various costs through the system. The programming element would then examine the alternative manpower costs of different policy regimes to specify a set of policies which could manipulate the flows so as to meet an official statement of personnel requirements at minimum manpower cost.[1]

There are difficulties with such an approach. To begin with, informational requirements for the analysis are substantial. Cost formulations are especially difficult to obtain, particularly for such significant indirect costs as productivity and morale effects. But more important than that is the fact that manpower requirement quotas are taken as given. We must ask whether a statement of official personnel requirements is to be accepted at face value. Should not our objective be to select policy options which will enable specified <u>output</u> goals to be provided on a sustained basis at minimum

production costs, rather than policies which meet specified manpower goals at minimum manpower cost?

Where meeting official personnel requirements at minimum cost is the stated objective for manpower planning those requirements operate as constraints in a programming analysis.

This observation immediately suggests one way to evaluate the consequences of imposing such requirements. We simply examine the shadow prices of the manning constraints generated in their solution and so make explicit the cost saving which would be obtained if the manning constraints were (marginally) relaxed. Conscious decisions can then be made as to whether the costs are worth paying. As Robert Dorfman has suggested, shadow prices can be used in this way to elicit true preferences of policy makers.[2]

The imposition of rigid personnel requirements implies a rather drastic assumption as to the trade-off between personnel and costs: zero for overmanning and infinite for undermanning; and equally for the trade-off between different inputs: no substitution is possible.

Such drastic assumptions should be investigated. It is evident that frequently significant substitution possibilities will exist. At the broadest level we could consider substitution in international alliances--for instance the suggestion of "a more stringent division of labor among

NATO countries eliminating the need for each alliance member to maintain all three services."[3] Similarly, within a national defense establishment, although the several services are generally assigned different missions, many of the activities performed by one service can substitute for those performed by another service. An increase in fire-power, for example, can be achieved by increasing either the size of the Air Force (tactical air support), Army (ground support) or Navy (sea or air support).

Next, within each service capital-labor substitution can be examined, both as to weapons systems and in-service support areas. For example, the Australian experience in Vietnam was that to be able to operate within range of artillery reduced the number of men required to withstand equivalent attack without artillery back-up by about one-third.[4] In the maintenance area an alternative to repair by skilled tradesmen is to increase inventories of spare parts. Finally there are substitution possibilities between different types of capital (e.g. gas turbines vs. steam engines) or between different types of labor (e.g. doctors vs. medics). Such substitution opportunities can be made quite indirect and subtle, operating through a process of marginal readjustment and redefining of tasks, say along a process line, but ultimately leading to a substitution for say, raw recruits and experienced sergeants even though there is no man for man replacement between them.

To incorporate full recognition of these substitution possibilities into planning though is no easy task. In the economic anlysis of production by a profit maximising firm, optimal input combination is readily specified. We use a production function (isoquant set) to summarise production possibilities:

$$f(K_i,\ldots,K_n, L_i,\ldots,L_r) = Q \qquad (3.1)$$

where K_i is the i^{th} type of capital $(i = 1,\ldots,n)$

L_i is the i^{th} type of labor $(i = 1,\ldots,r)$

Q is the output parameter.

If Q is fixed we obtain the equation of one isoquant of the system, showing the alternative input combinations which can produce the fixed level of output $\bar{Q}$. Minimum cost for producing a fixed level of output $\bar{Q}$ is obtained when the last dollar spent on any input adds to output the same amount as it would if spent on any alternative input.

But for private firms the motive of profit maximisation or the spur of competition ensures some approximation to these optimal input combination conditions. The whole military manpower planning discussion arises because these elements are lacking for the production of defense. We even have difficulty for defense in ascribing meaning to the product itself, and hence to the concept of a "military

production function." What is the output measure for national defense?

We lack for defense a clear-cut objective function, and hence cannot consider any over-all direct optimisation criterion. Objectives become instead defined incrementally through a learning process, and problems are best thought of in terms of their components, with total solution only emerging as an aggregate of partial solutions. It is suggested that in the face of uncertain and changing overall objectives suboptimisation is the appropriate approach to bureaucratic resource allocation.[5]

For sub-optimisation we can conceive of defense as being composed of various military missions. This can be represented as:

$$Q = f(M_1, M_2, \ldots, M_n) \qquad (3.2)$$

where Q is national defense

M_i is the i^{th} military mission $(i = 1,\ldots,n)$

Each of these missions can itself be thought of as a function of the capital and labor in that mission:

$$M_i = g_i(\underset{\sim}{K}_i, \underset{\sim}{L}_i) \qquad (i = 1,\ldots,n) \qquad (3.3)$$

where $\underset{\sim}{K}_i$ is the vector of capital inputs used in the i^{th} mission

$\underset{\sim}{L}_i$ is the vector of labor inputs used in the i^{th} mission.

In this representation, national defense comprises an output for each separate mission, and each mission output is a constraint for determination of the least-cost combination of inputs required to achieve that mission. The mission outputs themselves are inputs into a higher level of central decision-making, but are the operational meaning of national defense.

Actual application of the suboptimisation approach is not an easy task.[6] Implementation through decentralization, for instance, runs into conflicts of objectives between higher and lower authorities and produces a need for controls such as vetoes, constraints, incentives and so forth, which can hold conflicts within tolerable limits. There is also the task of ensuring that the appropriate level of decomposition of the problem has in fact been attained. The essential condition is that disaggregation be such that the marginal rate of substitution between inputs within a mission are independent of the values of inputs outside that mission. If that condition is not met then important interdependencies remain, and suboptimisation runs the risk of ignoring potentially significant substitutions between missions. Devices for dealing with these interdependencies must be invented, such as well-designed committee systems to deal with common inputs, or recursive optimisation where operations are performed sequentially.

A third requirement is that the mission output itself must be well-defined. This may mean measurability as with, say, amounts of bomb damage to an enemy industrial production capacity or probabilities of vessel detection in anti-submarine surveillance. But operationality is possible without direct cardinal measurement of output. For many purposes simple ordinal comparisons of the effects of different input combinations will be adequate. To be able to assess whether military effectiveness is made "greater," "less," or "the same" will often suffice.

In our area of interest this ordinal technique might mean that we could take an official personnel requirements statement and treat it as a point through which we wish to pass an indifference surface (isoquant) showing what trade-off can be made between different factors while leaving the level of military effectiveness associated with the requirements statement unchanged. Such an indifference surface could then replace a personnel requirements statement as a constraint in a manning optimisation problem, and cost could now be minimised subject to this more satisfactory constraint.

Previously, manning was segmented off and treated as a suboptimisation problem within the personnel requirements quota constraint. In fact it seems that this initial approach represented inappropriate disaggregation since it implicitly

ignored the very important substitutions possible between factors. The planning process for manning is really better seen as one of selecting policy options that will enable each specified military output (effectiveness) goal to be met efficiently at minimum allocation cost.

Of course effectiveness is still a constraint and as such, if taken literally, implies no trade-off between effectiveness and cost. Cost sensitivity is likely to be relatively smaller for an effectiveness constraint than a personnel requirements constraint, since the former does consider more substitution possibilities. But due care should still be taken, say through shadow price calculations, that this trade-off between cost and effectiveness has been recognized, and that the level imposed reflects a "true preference" of the policy maker.

Alternative Recruitment Systems

It will not be our task here to investigate optimum input allocation for military missions and so derive efficient total demand specification for inputs. Rather we take the planning process and planning institutions as given--whether optimal or not--and look only at one support activity which is not mission specific or rather can be considered a separate program viz. recruitment. For analytic purposes recruitment may be regarded as the primary element in a sequence for which suboptimisation can be performed recursively.

This perspective means we explicitly neglect a whole range of factor substitutions of potential importance to the manpower demand question. Much discussion has been devoted to such issues as the possibilities for substitution of women for men, reserves for regulars and civilians for military personnel.

Many of these areas of possible substitution do undoubtedly provide scope for reducing military enlistment requirements, though we should wish to employ such opportunities only if it is economically efficient to do so or if there is a compelling non-economic reason e.g. equal rights for women including the right to participate fully and equally in military service. The international perspective does raise some interesting questions as to substitution possibilities when one observes the different patterns of relative female, civilian, reserve, officer and capital usage indicated in Table 3.1. These patterns are only suggestive of a need for further investigations however since it is clear that international differences in definitions, objectives, technology, factor costs and output levels will explain a significant part of the divergence.[7]

But whether opportunities for gainful inter-alliance, inter-service or inter-factor substitutions exist will not be considered here except if such opportunities are influenced by choice of recruitment system.

TABLE 3.1 INTERNATIONAL FORCE STRUCTURE DIFFERENCES

(Proportions of total strength, 1966-1973)

	UNITED STATES		BRITAIN		CANADA	AUSTRALIA	
	Defense	Army	Defense	Army	Defense	Defense	Army
Officers	.12	.11	.13	.11	.15	.13	.13
Reserves	1.07	1.25	1.14	1.99	.28	.45	.77
Women	.01	.01	.04	.03	n.a.	.04	.03
Civilians	.44	.42	.76	.53	.48	.59	.24
Rejections*	.69	.64	.60	.54	.73	.72	.69

(*proportion of applicants for enlistment)

Sources: United States: Department of Defense, Selected Manpower Statistics;

Britain: Statement on Defence Estimates, Presented to Parliament by the Secretary of State for Defence;

Canada: International Institute for Strategic Studies, The Military Balance;

Australia; Department of Defence, Defence Report;

Also unpublished data from Defense Department in each country.

We put aside for later discussion in Chapter 5, the possible allocative effects associated with the differing price signals imparted by alternative procurement systems. There is an interdependence here, extending from recruitment activities to allocation in other missions, but it does not affect the marginal rate of substitution between inputs. It affects instead the factor-price ratio employed in relation to marginal rates of substitution in optimal decision-making. The point for our immediate purposes is that this is a matter that could be corrected by appropriate central specification of the shadow price that is to be used for suboptimisation with military labor in other missions.

Within these delimitations we now wish to examine how the alternative recruitment systems of draft vs. voluntary enlistment influence military manpower requirements.

Two types of effect can be discerned. One is the difference between the procurement systems as regards their turnover experience and the different levels of accessions that this implies. This is a quantity impact upon numbers of recruits required. The second type of effect is the quality impact--the effect of procurement systems upon the military productivity of the personnel in the associated forces.

Differences in Accession Levels.

We first examine the quantity aspect. We are thus concerned only with the number of personnel contributing

in turn required by them. We can represent this effect as[9]:

$$S = \frac{1}{m} pS + \frac{1}{m} pkS + R \qquad (3.4)$$

$$= \frac{R}{1 - \frac{p}{m}(1+k)} \qquad (3.5)$$

where S is the total enlisted strength

R is the operational force strength

m is the average period of service

($\ell = \frac{1}{m}$ is the loss rate)

p is the training period

k is the ratio of training-associated personnel to trainees.

Reducing the loss rate means that the total number of enlisted men can be reduced while keeping the operational force strength constant.

Making the calculation of training and support strength savings due to use of volunteer procurement gives the all-volunteer force-strength equivalent to the specified with-draft force strength. Applying the respective loss rates to those strengths gives the alternative steady-state accession requirements corresponding to the given level of effectiveness under alternative procurement systems.

We can summarise this process of determination of quantitative personnel requirements under the different recruiting systems as follows, for procurement system i and time period t:

to combat capability, not the quality of that contribution. The effectiveness criterion, in this limited sense, is the ability to field and sustain in operations a given-size combat force. To determine the effect of alternative procurement systems here our task is to take the official statement of personnel requirements under the prevailing procurement system as given, and to estimate what the personnel requirements would need to be under the alternative procurement system to produce the same level of implied effectiveness.

Differences in personnel requirements in terms of accessions will arise from two sources: a volunteer force will reduce accession needs directly through the longer service of volunteers, and it will also do so indirectly through the reduction in training and support strength thereby facilitated.

The lower turnover of a volunteer force results from the career orientation of volunteers, as opposed to single term conscripts. The difference in loss experience can be summarized by a table showing the probability of remaining on active duty after n years of service. Table 3.2 presents such retention profiles for the U.S. and Australia. The extremely small number of draftees who choose to remain in service after two years is reflected in the comparison between volunteer only and total force retention patterns.

TABLE 3.2. RETENTION PROFILES FOR MALE ARMY ENLISTEES, AUSTRALIA AND UNITED STATES

(Proportion on active duty after n years)

	AUSTRALIA[1]		UNITED STATES[2]	
Years of Service, n.	Volunteers Only	Total Force	Volunteers Only	Total Force
0	1.000	1.000	1.000	1.000
1	.952	.947	.900	.900
2	.916	.258	.829	.443
3	.670	.181	.174	.087
4	.640	.173	.165	.083
5	.617	.167	.156	.078
6	.389	.105	.130	.065
7	.370	.100	.124	.062
8	.354	.096	.120	.060
9	.311	.084	.097	.049
10	.295	.080	.094	.047
11	.251	.068	.091	.046
12	.226	.061	.086	.043
13	.210	.057	.084	.042
14	.197	.053	.081	.041
15	.175	.047	.049	.040
16	.157	.042	.077	.039
17	.150	.041	.075	.038
18	.140	.038	.073	.037
19	.128	.035	.071	.036
20	.116	.031	.069	.035
SUM, all years	8.957	3.851	4.867	3.458

1. Based on retention experience of mid 1960's.

2. Based on retention experience of late 1950's.

Sources: Australia: unpublished data, Directorate of Manning, Army Headquarters, Canberra; United States: Walter Y. Oi, "The Cost and Implications of an All-Volunteer Force," in Sol Tax, (ed.) The Draft: A Handbook of Facts and Alternatives, Chicago: The University of Chicago Press, 1967, p. 230.

The tables are based on specified conditions of service and while experience indicates that "wastage" between re-enlistment points is fairly constant, the rates at the re-enlistment points themselves are likely to vary according to the conditions of service specified. Retention profiles based on other conditions of service can be constructed by adjusting the alternative resultant re-enlistment rates at the appropriate key points.

The retention profiles provide a convenient basis for determining over-all loss experience. The sum of the retention probabilities gives the force strength that could be sustained by a one man input per annum. This is the integral under the retention profile, and the loss rate for a stable force is thus simply the reciprocal of the sum. For the retention experience specified in Table 3.2 the implied loss rates are as given in Table 3.3.

TABLE 3.3

LOSS RATES FOR GIVEN RETENTION PROFILES.
(percentages)

	Australia	United States
Volunteers Only	11.2	20.5
Total Force	26.0	28.9

Source: Table 3.1.

It is apparent from Table 3.3 that the accessions needed to replace losses from strength will be considerably less under a volunteer system than for a mixed-force which uses a draft.

Two elaborations of this statement are in order. The first is that since the retention profile for military service is typically non-exponential, due to the fixed term of service in military employment, the loss rates are strictly only valid for a steady state situation.[8] In practice accession requirements will vary from year to year even for a given total force size due to varying external factors affecting losses and also with the influence of previous patterns of accessions. The second point is that the volunteer loss rate figures in Table 3.3 overstate the loss rate for a non-draft situation, because they include the lower retention experience of draft-induced volunteers and do not incorporate the effect of the improved conditions of service that would be associated with a fully volunteer force. We examine this below.

We can turn now to the indirect source of difference in quantitative personnel requirements between a draft and a volunteer system. It follows directly from the lower turnover experience of a volunteer force. This lower turnover will itself reduce the support strength required for a given operational capability, because lower accessions reduce the size of the necessary stock of trainees, trainers and transients and the supply and administrative elements

$$A_{it} = L_{it} + (S_{it} - S_{it-1}) \tag{3.6}$$

where A_{it} is accessions

L_{it} is losses

S_{it} is enlisted strength

In the steady state $S_{it} = S_{it-1}$, so that:

$$A_{it} = L_{it} \tag{3.7}$$

$$= \ell_i S_{it} \tag{3.8}$$

where ℓ_i is the loss rate.

For the two alternative procurement systems of draft (D) and volunteer (V), we thus have accessions given by:

$$A_{Dt} = \ell_D S_{Dt} \tag{3.9}$$

$$A_{Vt} = \ell_V(1-\alpha) S_{Dt} \tag{3.10}$$

where α is the change in the operational force ratio, $\frac{R}{S}$.

The value of S_{Dt} is the given force strength under a draft system, and the key parameters to be estimated to determine alternative personnel requirements are the loss rates, ℓ_D and ℓ_V, and the proportionate change in non-operational forces, α.

The calculations in Table 3.4 illustrate an application of this framework for the United States and Australia. The calculations take as the given with-draft force strength, S_{Dt}, the army force levels applying for the immediate pre-Vietnam period. Male non-officer personnel only are included. A full analysis would consider the other services, and women and officer accessions. But it can be assumed that if

TABLE 3.4. PERSONNEL REQUIREMENTS UNDER DRAFT AND VOLUNTEER RECRUITMENT: ANNUAL ACCESSIONS

	UNITED STATES	AUSTRALIA
Mixed-force strength (S_{Dt}) -army male enlistees	870,000	40,000
Draft percentage of strength	.23	.40
Draft-induced percentage of strength	.25	.00
Mixed-force loss rate (ℓ_{Dt})	.289	.26
Ready-force differential (α)	.075	.10
Pay elasticity (β)	2.43	1.63
True-volunteer loss rate (ℓ_{Vt}):		
$WM_{Vt} = WM_{Dt}$	.153	.112
$WM_{Vt} = 1.15\ WM_{Dt}$	.132	.096
$WM_{Vt} = 1.3\ WM_{Dt}$	.127	.084
Accessions:		
Mixed-force (A_{Dt})	251,430	10,400
Volunteer-force (A_{Vt}):		
$WM_{Vt} = WM_{Dt}$	133,110	4,480
$WM_{Vt} = 1.15\ WM_{Dt}$	114,840	3,840
$WM_{Vt} = 1.30\ WM_{Dt}$	110,490	3,360

WM = Military Wage

conditions of service are made attractive enough to use all-volunteer procurement for male enlisted army personnel, no recruitment problems will obtain elsewhere either.

Estimates of the changes in the operational force ratio are obtained from other sources--a Rand report for the U.S., and the Department of the Army for Australia.[10] The with-draft loss rates are as given in Table 3.3. The no-draft loss rates are calculated on the same basis as they were for Table 3.4, except that we adjust the retention profile in accordance with the effect on re-enlistment of specified alternative changes in relative wages as well as abolition of the draft. For the U.S. an appropriate re-enlistment equation was estimated on 1964 and 1967 cross section data by Gary Nelson.[11] Comparable data was not available for Australia, so a time-series regression for the period 1966(3) to 1972(2) was performed instead. The results for both regressions are reported in Table 3.5, with full details of variable definition and estimates and procedures being given in Nelson for the United States regression and in the Data Appendix to this study for the Australian regression.

We note that the Australian re-enlistment estimation does not make allowance for the draft-induced component. The formulation of appropriate lags is very difficult for time series analysis at the re-enlistment level, whereas the cross-section analysis was able to make appropriate

TABLE 3.5. SUPPLY OF ARMY RE-ENLISTMENTS: REGRESSION ANALYSIS

UNITED STATES, crossection 1964 & 1967		AUSTRALIA, quarterly, 1966 (2) - 1972 (2)		
Variable (logarithm)	Coefficient (t-statistic)	Variable	Coefficient (t-statistic)	Elasticity*
Dependent Variable	RERA	Dependent Variable	NRERA	
Relative Pay	2.43 (6.75)	Relative Pay	-34.17 (-1.85)	1.63
Draft Pressure	0.488 (1.95)	Unemployment	-4.12 (-0.70)	.105
Dependency Status	0.179 (0.361)	Six-year Term Proportion	-15.38 (-1.46)	.702
Vietnam Service	-0.436 (-1.503)	Proportion of Strength Eligible	41.67 (11.08)	1.15
Combat Status	0.0647 (0.209)	Time Dummy	-0.27 (-2.43)	
Constant	-1.87 (-7.48)	Constant	40.71 (12.10)	
R^2	.572	R^2	.950	
N	185	N	24	

RERA = Re-enlistment Rate Army

NRERA = Non Re-enlistment Rate Army

* Evaluated at means of the variables

TABLE 3.5. SUPPLY OF ARMY RE-ENLISTMENTS: REGRESSION ANALYSIS

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R^2	.572	R^2	.950	
N	185	N	24	

RERA = Re-enlistment Rate Army

NRERA = Non Re-enlistment Rate Army

* Evaluated at means of the variables

adjustments from survey data results on draft-induced enlistments. But the Australian lottery draft system and the low level of draft pressure there, probably means that this is less a problem for Australia than its neglect would be for the U.S. (See Chapter 4.)

The accessions indicated in Table 3.4. illustrate military labor demands under the alternative procurement systems. The accessions requirements of a volunteer force will be considerably less than for a force using a draft, and without any loss of military capability as measured by the size of the operational force.

The calculations outlined in Table 3.4 are steady state requirements only, and apply to the conceptual experiment of instantaneously changing from a mixed-force to an all-volunteer force. In reality such a change would involve a transition period during which not only losses from the existing volunteer strength would need to be replaced,but also the volunteer equivalent of the conscript and conscript-related strength component. This would usually imply higher transitional than steady state accession requirements, depending upon the length of the transition period and the willingness of the government to permit temporary rundowns of total Army effectiveness.

It is possible that such implied inter-temporal substitutions might not be acceptable. For this substitution at least, the implication of a minimum constraint that no

decline in this year's force can be compensated for by an increase in another year's increase may be realistic. As Franklin Fisher has put it: "it is small consolation to a nation overwhelmed by enemy attack that its forces were more than prepared in another year."[12] But this too is a matter for conscious decision in the light of strategic needs.

Differences in Personnel Quality

The criterion of effectiveness applied in the demand analysis to date is that of quantity of operational personnel sustainable by accession flows. We now consider the quality of the contribution by personnel under alternative procurement systems. While this has both demand and supply elements it is conveniently discussed here.

Demand for personnel quality possesses two components--the minimum enlistment standards required, and the distribution of quality required (above the minimum). It is commonly stated that a mixed-force produces superior quality personnel since more highly educated and able individuals are drafted or induced to enlist than would otherwise be the case, and because under a volunteer force the military may be forced to lower standards if accession numbers fall short of requirements.

It is not clear that these points are valid. We do well to remember that the greater proportion of forces with a draft are still volunteer and that the high-skill force components are fully-volunteer. Inductees are not given specialized training in high aptitude areas because they

simply do not remain in the service beyond the compulsory term. Volunteers on the other hand will be much more experienced personnel than conscripts since their average length of service is typically three to four times greater than for draftees and they thus receive much more formal and on-the-job military training than draftees. The exact trade-off between experience and education in producing military effectiveness is not known however, and is further complicated by the differing motivation of volunteers and draftees, presumably to the benefit of volunteer productivity.

Measurement of the trade-off is not essential to the evaluation, however, since it is not necessarily the case that a volunteer force will attract only "ill-educated low-aptitude soldiers".[13] The experience of Britain and Canada does not indicate significant problems with the quality of recruits under volunteer enlistment. The ending of National Service for Britain saw "no significant deterioration in the quality of entrants"[14] and for Canada it is reported that almost all entrants to the service "fall within the upper half of the population as measured by mental aptitude."[15]

For the United States it has been shown that an end to the draft would, by extrapolation of the education and mental test levels of existing true volunteers, still produce a force that "if the occupational mix of the base line force structure for the years ahead were staffed in the same way that comparable occupations are staffed in the civilian

economy, these percentages of high school graduates would achieve the same quality mix for the Army as that of the civilian labor force."[16] This calculation assumes the same conditions of service with and without a draft. But a volunteer force will be accompanied by improved conditions of service, so that a military career will become more attractive to individuals who otherwise would not consider the military because of the attractive civilian alternatives available.

A study of United States Air Force accessions by A. A. Cook estimated separate regressions for all enlistments and found highly significant pay effects with the elasticity greater for the highest mental group--.236 as opposed to .219 for all enlistments.[17] The difference in elasticities is not really large and the analysis, which was based on quarterly data for 1957 to 1966, did not cover zero draft experience, but it does seem that there is a presumption that higher mental group enlistments will not be proportionately less in response to volunteer military pay increases.

In our own supply analysis of the next chapter we do not review the quality distribution pattern owing to lack of education or mental test data for other countries. But we do directly consider the question of numbers meeting minimum enlistment standards. This is done by including a quality acceptance variable which, while it is a mix of demand and supply factors, allows us to control for shifts in the supply curve due to changes in the proportion of

acceptable recruit applicants. In policy analysis we can then constrain the quality variable to a given minimum acceptance level and so examine supply patterns under alternative procurement systems for a given quality criterion.

At what level should minimum acceptable standards be set? For the supply analysis we adopt the standards prevailing under a mixed-force, and examine volunteer procurement subject to the same constraint. We should note, though, that this level may be unnecessarily high. Procurement alternatives may affect standards not only with the possibility of volunteer shortages inducing reductions in standards, but with a draft inducing an increase in standards beyond the necessary level. (Figure 4.2 in chapter 4 illustrates these alternate possibilities). And there is more hard evidence to support the latter effect than for the feared volunteer force effect on minimum standards.

An indication of this is the steady increase in rejection rates for the Army in the U.S., from 23% in World War II to 35% in 1964. The increase was entirely due to increased mental rejections at a time of increasing general level of education. The effect is seen in an equation (3.11) provided by Stephen Canby,[18] which regresses Mental Category IV (the lowest acceptable category, representing 10-30 percentile on the test) pre-inductee acceptance rates on population and unemployment for young men:

$$R = -2.95 + \underset{(3.28)}{.026P} + \underset{(2.40)}{.889U} \qquad R^2 = .81 \tag{3.11}$$

where R = rejection rate, P = population of 18-year-olds and U = unemployment rate for 18-19-year-olds. The figures in parentheses are t-values. If P is redefined as an excess supply variable (i.e. supply of 18-year-olds minus all enlisted accessions), 76 per cent of the variation is associated with this alone. The data period is 1952 to 1965.

A possible weakness in interpreting the effect of excess supply with a draft on rejection rates is that the equation does not allow for technical change in military production techniques, so that there may have been an increasing technology-derived requirement for higher quality recruits in terms of education and technical aptitude, in order to operate increasingly more sophisticated and complex military equipment.

The period since World War II has indeed witnessed a substantial growth in technical positions and a decline in the relative number of billets for the military generalist--particularly ground combat. The occupational distribution of U.S. army enlistees is given in Table 3.6 for selected years 1945-1974 to illustrate this. Defining high-skill occupations as electronic and other technical, the major increase in skill need was 1945-1957, which saw an 80 per cent increase in the high-skill proportion. 1957 through 1963

TABLE 3.6. OCCUPATIONAL DISTRIBUTION OF ARMY ENLISTEES: UNITED STATES, 1945-1974

OCCUPATIONAL AREA	PERCENT DISTRIBUTION					
	1945	1953	1957	1963	1969	1974
Ground Combat	39.3	34.4	31.2	28.8	25.7	21.2
Electronics	3.8	4.9	9.3	9.1	7.0	7.4
Other Technical	6.6	7.3	8.5	8.6	14.7	16.6
Administrative & Clerical	15.1	19.1	16.3	18.6	19.5	21.5
Mechanics & Repairmen	8.9	12.1	13.7	16.5	16.3	16.6
Craftsmen	7.1	3.2	4.9	3.7	4.0	3.5
Services	19.2	19.1	16.1	14.5	12.7	13.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Source: 1945-1963, Harold Wool, The Military Specialist, Baltimore: John Hopkins, 1968, p. 43; 1969-1974, Office of Secretary of Defense (Manpower & Reserve Affairs), October, 1974.

saw little change in relative high-skill requirements but a further increase of 30 per cent in needs was evident 1963-1974.

Clearly there was a need for a higher proportion of entrants with aptitudes appropriate to advanced electronic and other technical training, and this should account for an important part of the increase in U.S. Army rejection rates since World War II. Still there is additional evidence that it does not account for the whole increase. The difference between U.S. Army enlistment and induction standards after 1958, for instance suggests that minimum qualifications were not unrelated to supply conditions. Individuals who were rejected for voluntary enlistment could still be drafted for two years. Further suggestive evidence is given in a study by Reaume and Oi[19], who found that when detailed military occupational specialties were matched to comparable civilian occupations, the military tended to employ higher quality personnel, where quality was measured either by educational attainment or mental test scores. Some more recent evidence also supports this point. Table 3.7, which compares the percentage distribution of the total U.S. non-college population (ages 19-21) by mental group (as defined by the Armed Forces Qualification Test) to that of true volunteers in fiscal 1973, shows that the military services attract people who possess higher qualifications than the non-college population.

TABLE 3.7. MENTAL CATEGORY DISTRIBUTION OF ENLISTEES AND NON-COLLEGE CIVILIANS (AGES 19-21), 1972-73. (percentages)

AFQT Mental Group	Non-college Population	True Volunteers
Above Average, I and II	24	29
Average, III	39	54
Below Average, IV	24	17
Not Eligible, V	13	0
TOTAL	100	100

Source: U.S. Department of Defense, Office of the Assistant Secretary of Defense, Manpower & Reserve Affairs, (April 1973)

In comparing alternative procurement systems in their impact on quality demanded for personnel, it seems that volunteer recruitment may actually serve as a corrective against overstated acceptance standards. Further research is needed here on just what the appropriate standards are, but it is evident that a draft system can have access to higher-quality personnel, (at least for the period of compulsory service and in so far as quality is measured by education and mental-test scores), by simply raising standards. At the same time there is other evidence that the quality of personnel obtained under a volunteer system can be quite adequate, even taking the with-draft entrance standards as appropriate. Moreover

the volunteer force has the additional, but difficult to measure, advantage of individually motivated (as opposed to compelled) recruits and more experienced personnel than does a draft system.

CHAPTER 4: MILITARY MANPOWER SUPPLY

"All Englishmen then have, as you say, Gentlemen, a Liberty not to Fight for their Country, and no Body can make 'em do it, unless they, kind hearts, should happen to be in good humour and offer their Service themselves."

Captain George St. Loe
A Discourse about Raising Men, (1688)

The task in this chapter is to investigate the supply of labor to the military services with a view to assessing the adequacy of voluntary enlistment for peacetime (including limited war) military forces. We propose a model of enlistment behavior based on the economic theory of occupational choice and use this to specify an econometric model for empirical application to the four countries being considered. Linking the supply estimation with specification of military manpower requirements then permits the estimation of budget cost of balancing supply and demand in the military labor market through competitive wage adjustments.

A MODEL OF ENLISTMENT BEHAVIOR

Theoretical Model

Recruits for the armed forces come from the pool of national manpower over the minimum school leaving age. Women have traditionally been excluded from significant military participation so that the basic pool can be considered to comprise men only. The total number of

men available are the survivors of those born in past years, adjusted for net migration. The requirement for entry at the bottom of the military hierarchy tends to restrict recruitment from this available population to young men, since they tend to be less established in civilian job progression structures. For similar reasons those young men committed to continuing education and apprentice training programs in the civilian community tend not to enlist, and so restrict the recruit population base. A further restriction, and one reinforcing the age bias in recruitment, is eligibility for military service. The imposed requirements on physical, mental and character standards naturally reduce the population that will be acceptable for military service. This standards factor, though, is one element that is a policy control variable for the military, and so we reserve its incorporation into the model until a little later.

For the present we express the available population for military enlistment as:

$$RP = (1 - p_T)\ P_{M>SL} \qquad (4.1)$$

where RP = recruit population

$P_{M>SL}$ = population of young males above school-leaving age

p_T = proportion in continuing education and apprenticeship

What will determine the number forthcoming for enlistment from this recruit population? Each individual within this population can be viewed as facing a choice between a military job and a civilian job (the best of those civilian positions open to the individual.) The individual surveys each job and considers the advantages and disadvantages of each, such as expected earnings, expected advancement, working conditions, location, etc.

In principle these advantages and disadvantages can be classified as pecuniary and non-pecuniary, and we assume that there is some finite rate of exchange between pecuniary and non-pecuniary factors so that an individual can evaluate non-pecuniary costs and benefits in net and pecuniary terms. The individual then selects the job with highest net advantage, given these opportunities open and the individual's preferences.

The choice is made on the basis of the individual's perception of these net advantages, which may or may not be an accurate reflection of the real net advantages, and account is taken of the future pattern of costs and benefits with appropriate discounting for time.

The individual is assumed to seek to maximize utility in terms of net advantages. There is no assertion of purely pecuniary motivation. The choice criterion is that an individual will enlist in the military if

$$WM > WC + dWC \tag{4.2}$$

$$\text{where } WM = \sum_{t=1}^{n} \frac{WM_i}{(1+\beta)^n} \tag{4.3}$$

$$WC = \sum_{t=1}^{n} \frac{WC_i}{(1+\beta)^n}, \tag{4.4}$$

with WM_i being military earnings and WC_i civilian earnings in period i. β measures the individual's subjective discount rate.

The stream of earnings, WM_1, WM_2,....WM_i,....WM_n, may include income expected from civilian employment subsequent to military service.

The coefficient 'd' measures the individual's net preference for the non-pecuniary aspects of military life, expressed as a percentage of civilian earnings. d may be positive or negative. Presumably a pacifist has d equal to plus infinity. The coefficient thus encompasses all situations by compacting the full variety of non-monetary considerations into the single summary measure of tastes.

Naturally individuals in the recruit population will differ as regards their alternative civilian employment opportunities and their relative preferences for military vs. civilian life. For each person, though, we can postulate a reservation military wage, WM^*, that would make the sum of pecuniary and non-pecuniary net benefits from military employment just equal to that pertaining for the best civilian employment alternative available. i.e.

$$WM^* = WC + dWC \tag{4.5}$$

At the reservation military wage, each individual is indifferent between enlisting and not enlisting. If WM > WM* then the individual would enlist.

In principle, individuals may be arrayed according to their reservation military wage, so creating a frequency distribution like that illustrated in Figure 4.1 for the unimodal symmetric case. The frequency distribution is the joint distribution of civilian earnings and relative tastes for military service. For a given WM, all individuals with reservation military wages smaller than this actual military wage will enlist. The cumulative frequency distribution of reservation military wages thus defines the supply curve of military labor in relation to alternative levels of military earnings, other things being held constant. It follows that the general form of the enlistment supply function is:

$$\frac{A}{RP} = f(WM, M_{WC}, \sigma_{WC}, M_{dWC}, \sigma_{dWC}) \qquad (4.6)$$

$$= f(WM, M_{(1+d)WC}, \sigma_{(1+d)WC}) \qquad (4.7)$$

where A is applications for military enlistment

RP is recruit population

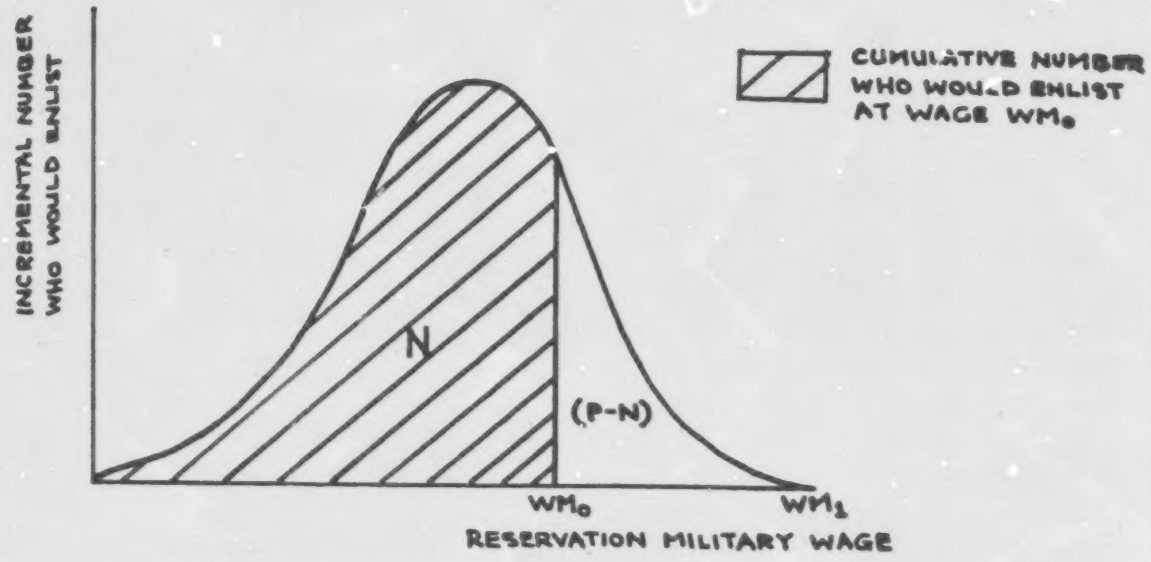
WM is expected military earnings

M_{WC} is the mean value of expected civilian earnings

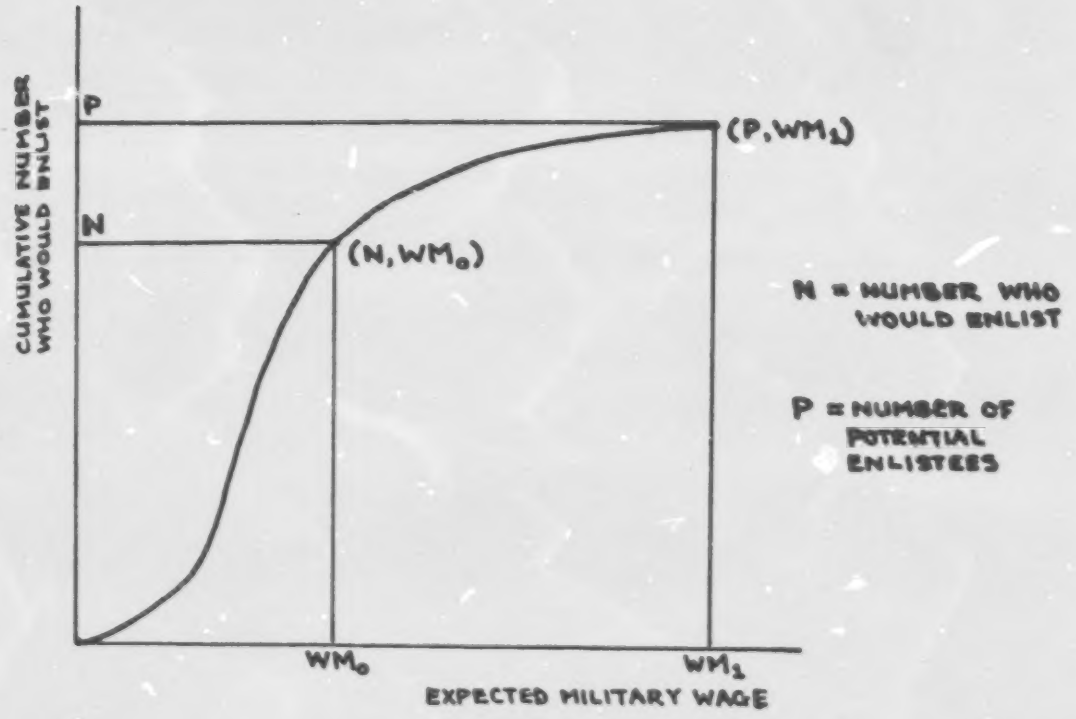
M_{dWC} is the mean value of relative military tastes

σ_{WC} is the standard deviation of expected civilian earnings

σ_{dWC} is the standard deviation of relative military tastes



A) FREQUENCY DISTRIBUTION OF POTENTIAL ENLISTEES CLASSIFIED BY THEIR RESERVATION MILITARY WAGE



B) AGGREGATE ENLISTMENT SUPPLY CURVE

FIGURE 4.1. MILITARY LABOR SUPPLY FUNCTION

From the model of rational occupational choice it follows that we impute the following properties to military labor supply:

a positive function of the military wage:	$\frac{\partial A}{\partial WM} > o$	(4.8)
a negative function of the civilian wage:	$\frac{\partial A}{\partial WM} < o$	(4.9)
a positive function of the relative taste for military service:	$\frac{\partial A}{\partial d} > o$	(4.10)
a positive function of the recruit population:	$\frac{\partial A}{\partial RP} > o$	(4.11)

The specific properties of the supply schedule will be given by the form of the joint frequency distribution of earnings and taste, $(1 + d)WC$. A convenient simplification of the model is to assume that the variance and distributional form of the earnings and taste components of the joint distribution do not alter over the period of analysis, though their mean level may. This means rewriting equation (7) as

$$\frac{A}{RP} = f(WM, \tilde{WC}, \tilde{d}) \qquad (4.12)$$

where $\sim$ denotes mean. Note that in using an applications rate as the dependent variable we assume that applications change equi-proportionately with recruit population.

We have so far considered a free market choice model. What difference does the existence of a military draft make to this model? Provided voluntary enlistment is still permitted, as is likely for peacetime, then the binary

choice situation remains. What alters is the structure of incentives influencing that choice.

If an individual chooses not to enlist, then he must now face the possibility of being conscripted. We therefore examine the effect of this possibility on enlistment choice by looking at the implications of a probability of being drafted on the expected pecuniary and non-pecuniary returns to remaining in a civilian employment.

On the pecuniary side we can now write

$$WC = (1 - p_D)WC' + p_D WM \tag{4.13}$$

where WC is the expected income from not enlisting

WC′ is the expected income from civilian employment

p_D is the probability of being drafted

The sign of the partial derivative $\partial A/\partial p_D$ will depend upon the sign of (WM-WC′). For (WM-WC′) < o, the usual case, the effect is

$$\frac{\partial A}{\partial p_D} > o \tag{4.14}$$

A similar effect obtains for the impact of the probability of being drafted upon the non-pecuniary returns to not enlisting. Remembering that the taste coefficient is a net measure, d > o is defined as a net aversion to military life. An increase in the probability of being drafted will

therefore increase d and thus produce an expected positive effect upon applications for enlistment. The non-pecuniary effects of the draft reinforce the hypothesis given in (15).

The total effect of the introduction of conscription on the supply function can be recognized by writing:

$$\frac{A}{RP} = f(WM, \tilde{WC}, \tilde{d}) = f(WM, \tilde{WC}', \tilde{d}', p_D) \qquad (4.15)$$

With this expression, WC′ itself can be written to take account of the fact that in civilian employment, unlike fixed engagement military employment, there is a chance of being unemployed i.e.

$$WC' = p_E WE + p_u WU \qquad (4.16)$$

where p_E is probability of being employed (= 1 - p_u).
WE is expected full time civilian earnings.
WU is expected income while unemployed.

In addition, unemployment may have a separate effect of its own which works through risk aversion. Individuals who are currently unemployed or have a high probability of being unemployed may value their income prospects at something less than their mathematical expected value - say because of such factors as the social approbrium or personal psychological loss attached to being unemployed. If this is so we should include a separate unemployment variable as an argument of the supply function.

The theory developed so far is actually one of supply offers - applications for military enlistment. What is important for military manpower strength is enlistments obtained. Translation of applications into enlistments is necessary. The conversion element is military enlistment standards but we must recognize that this involves two considerations: the pure supply factor of the quality of the personnel that offers itself, and the policy control factor of the level at which enlistment standards are set. If we assume that the variance and distributional form of quality is constant and that enlistment standards are fixed, then the supply equation becomes:

$$\frac{E}{RP} = f(WM, \tilde{WC}', \frac{U}{RP}, \tilde{d}', P_D, \tilde{Q}) \qquad (4.17)$$

where E is the number of military enlistments

$\frac{U}{RP}$ is the unemployment rate in the recruit population

Q is the quality level of recruit applicants.

We hypothesize:

$$\frac{\partial E}{\partial \tilde{Q}} > 0 \quad , \qquad (4.18)$$

since an increase in average quality will imply, ceteris paribus, a greater proportion of the recruit applicant population able to meet fixed enlistment standards.

Econometric Methods

We wish to estimate the supply function given in general form in equation (4.17). In earlier studies the assumption has commonly been made that the functional form chosen should express decreasing elasticity of supply with respect to military pay. Thus, Altman argued that: "As the number of enlistments increased, however, the size of the remaining population would fall and those left would have a weaker preference for military service. Thus, they could only be attracted to the military by proportionately higher levels of pay, i.e., the pay elasticities would fall."[1]

But the supply function depends upon the joint distribution of alternative civilian earnings and relative military tastes. It could be, for instance, that there may be a range of increasing elasticity as military income moves into a range where it becomes competitive for the populous group of middle income earners. A normal shaped joint distribution, for instance, would have a range of increasing elasticity followed by decreasing elasticity.[2] A continuously decreasing elasticity could, in this circumstance, be inappropriate, depending upon which segment of the function is relevant.

On the other hand there is some evidence that the civilian earnings component of the joint distribution is in fact distributed lognormally,[3] and it can be shown that

for a lognormal distribution the price elasticity of supply of enlistments will decrease over the whole range of increasing enlistments.[4] But this refers only to the distribution of earnings. We must also consider the distribution of tastes. And here, unlike for income, there is little established theory to guide us. Mathematically convenient results would be obtained if tastes too were lognormal, since then the sum of the logarithms of the two component distributions, WC and dWC, would be normally distributed. The available evidence, however, does not provide support for a lognormal assumption for tastes. One Australian survey, for instance, indicated that tastes, for the sample surveyed (N=100) and at the time surveyed (November 1968), were normally distributed.[5] A U.S. Survey, conducted in 1964 for a larger sample, indicated bimodality in distribution of tastes, as is seen in Table 3.1.

TABLE 4.1

ATTITUDES TOWARDS A MILITARY CAREER

Attitude	Percent
like very much	14.0
like fairly well	20.3
indifferent	23.1
dislike a little	12.0
dislike very much	30.6

Source: Project Talent: The American High School Student, University of Pittsburgh, 1964, Appendix E, p. 16.

It is quite possible that bimodality will be important in military tastes since this is one occupation with respect to which many people may have strong feelings one way or the other. It is not clear that we can assume that "the number of individuals with strong feelings either way diminishes as the strength of the attitude increases."[6] Unfortunately the survey evidence we have is not available on any continuing basis, and that evidence is anyway difficult to interpret definitively since much depends on the questions asked and the qualitative answer categories employed.

If the assumption of lognormality is felt inappropriate for military tastes, the outcome of a mixing of the relevant taste distribution with the civilian income distribution then depends upon the weights to be assigned to the component distributions. But these weights are unknown since they are dependent upon the relative strength of pecuniary and non-pecuniary preferences of individuals.

This inability to specify a priori the functional form for our estimating equation is a difficulty for adequate representation of the total supply function. But our concern is for that limited range of the supply function for which we have data and which is relevant to a peacetime military force. Accordingly a more ad hoc choice of functional form may not be too misleading. To this end logit, logarithmic, linear and log-complement specifications were estimated, and then compared using the criterion of minimum residual

sum of squares for equations in which the dependent variable had been standardized.[7] A non-parametric test using the chi squared distribution was adopted to test for significant differences in the residual sum of squares. Where the test indicated a difference at the .05 level the equation with minimum residual sum of squares was adopted. Where the hypothesis of difference was rejected at the .05 level, the logarithmic formulation was chosen, for its convenience in interpreting elasticities. The logarithmic form was the most commonly accepted functional form under the goodness of fit criterion so that the basic estimating form employed can be written as:

$$\ln \frac{E}{RP} = \alpha_0 + \alpha_1 \ln WM_t + \alpha_2 \ln WC_t + \alpha_3 \ln \frac{U_t}{RP}_t + \alpha_4 \ln d_t + \alpha_5 \ln p_{Dt} + \alpha_6 \ln Q_t + e_t \qquad (4.19)$$

The basic estimating equation is applied separately to total defense enlistments and to army enlistments for each country, using quarterly observations over the period 1966(2) to 1973(4). The exception to this is Canada where annual cross-section data, 1966 to 1973, was applied to total defense enlistments only. Quarterly data was unavailable for Canada and there are no individual service enlistments to the Canadian unified defense forces.

Single equation estimation is employed, at the risk of some bias since enlistment and induction rates, wages and unemployment rates are mutually related. The exact extent of this simultaneous equation bias is unknown, though the direction of effect will be to understate pay, employment, and induction elasticities of supply.[8] However since the civilian wage and unemployment variables are economy wide the bias is probably small, and the gain in convenience from single equation estimation is large. We chose to err on the side of understatement of elasticity of supply.

Because quarterly data is employed we add seasonal dummy variables to equation (3.19) and perform the regressions on seasonally unadjusted data. There are theoretical and empirical reasons for preferring this approach to a pre-adjustment of the data by some variation of the method of moving averages.[9] The existence of seasonality in the data can introduce serial correlation. But all equations were tested using the Durbin-Watson statistic, (or Durbin 'h' statistic when a lagged dependent variable was present). If the hypothesis of zero serial correlation could not be accepted at the .05 level of significance, adjustment was made by using estimates of the serial correlation coefficient obtained from the Cochrane-Orcutt iterative process.[10]

It will be noted that the formulation of the model given in equation (3.19) assumes that the dependent variable responds instantaneously to current changes in the

independent variables. For quarterly data, the forces of ignorance, inertia and the costs of change lead us to believe that adjustment and response may be partially delayed. The most convenient formulation of such a distributed lag process is to incorporate a lagged dependent variable as an additional explanatory variable. This assumes that part of the response to changes in independent variables takes place in the current period, with the remaining fraction of the adjustment spread over succeeding periods in diminishing increments. It also assumes that the adjustment process is the same for changes in each independent variable. With this lag we have a dynamic estimating equation which is written as:

$$\ln \left(\frac{E}{RP}\right)_t = B_o + B_1 \ln WM_t + B_2 \ln WC_t + B_3 \ln \left(\frac{U}{RP}\right)_t + B_4 \ln d_t + B_5 \ln p_{Dt} + B_6 \ln Q_t + B_7 \ln \left(\frac{E}{RP}\right)_{t-1} + v_t \qquad (4.20)$$

We perform regressions for both the static (instantaneous) and dynamic (lagged) equations, with the latter enabling us to estimate long-run, as opposed to impact elasticities from quarterly data.

The basic set of supply estimations is thus alternate defense and army dependent variables with both static and dynamic formulations for three countries. Canada is the exception since its unified defense force meant that only a

defense dependent variable was available, and annual data meant that a lagged formulation was not necessary. For all countries an additional set of regressions was performed, replacing separate military and civilian income variables by a single wage ratio variable, an amendation that is discussed in detail below.

One additional joint cross-section and time-series equation is estimated across states by quarters, 1966(2)-1973(4), for Australia, to take advantage of the richer army enlistment data available there, and for comparison with the national time series results. The estimation method employed was ordinary least squares with individual constant terms. The technique is also known as covariance analysis since a set of regressions is run with and without state dummy variables and for each state individually, and the resultant residual sums-of-squares are used to test the null hypotheses of no difference in slopes, no difference in intercepts and overall homogeneity for the states.

Estimates of Variables

Enlistments

Enlistments were estimated as total number of non-prior service male general enlistees. Enlistments originating outside the country were excluded since they would be related to external factors not represented in our estimates of the independent variables. Women and officers

were excluded since they represent a small proportion of military accessions, their enlistment is governed by special and different institutional factors, and a draft is largely used only for male general enlistees.

Fixed enlistment terms of engagement range from a minimum of three years for army enlistments in the U.S. to a maximum of 12 years for some Navy artificer trades in the Royal Navy. Most engagements are for 3 to 6 year periods, and we assume that the distribution of enlistees by term of engagement is constant. Where there is a change in length of service options available for enlistees, an enlistment term dummy variable is introduced. Canada is an exception to the fixed engagement system using indefinite career engagements with release on request.

Recruit Population

The available population is defined as the civilian labor force of males aged 15-19 last birthday. The age range 15-19 usually accounts for 70 percent or more enlistments for each country--since military fitness standards and the common commencing recruit wage tend to inhibit older applicants. The population is restricted to civilian labor force since individuals enrolled in school beyond school-leaving age will not be enlisting in the military while in school. It is also assumed that those continuing on to higher education through civilian institutions will have a low propensity to leave school and enlist--

though they could enter officer training programs. In cross-section analysis this could bias supply elasticity estimates by raising the enlistment rate from high income regions relative to low income regions. But for time-series analysis it is important to take account of the changes in propensity to continue on to higher education.

If differing propensities to enlist could be attributed to other groups in the population--regional or ethnic for example--it might also be useful to incorporate variables taking account of their representation in the population, or to estimate separate equations for different groups. The evidence here is meager, however, and the influence of changes in such factors is probably quite small for the period of our analysis. These factors are undoubtedly highly important for forecasting and for analysis of certain important social issues (such as black military participation in the U.S., French-speaking military participation in Canada, migrant enlistment in Australia and regional military representation in Britain). These are issues beyond the scope of our study.[11]

Earnings

Military earnings are defined as the commencing wage for military recruits, including the value of income in kind (rations and quarters) and the associated tax advantage where applicable. Combat associated pay is excluded which

may cause bias in estimation, e.g., in Australia regional allowances and war-service benefits were increasing at a time (1965-67) when, otherwise, the adopted military income measure indicates deterioration in relative military-civilian income at a time of increasing enlistments. Appropriate data could not be obtained to allow for this. Similarly for the U.S., proper allowance could not be made for the June 1972 and April 1973 schemes for payment of enlistment bonuses to volunteers for the combat arms and combat-related technical skills, respectively. We attempt to date pay changes to the time implemented, though again full information was not available and some changes may be announced or effective pay dates.

The measure is also deficient in that a longer earnings stream would have been preferable, to take account of changes in promotion rates and of differential civilian-military earnings profiles. Again adequate historical data could not be obtained, and so we must suffer estimation bias resulting from this source. It is hoped the bias is not large, since there is evidence that the subjective discount rates of young men are very high--of the order of 25-30 percent. This, plus the fact that a high proportion of men enlist with the deliberate intention of serving only one engagement, means that military income beyond the first few years of service has little weight in most enlistment decisions.

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The in-kind imputation made for military earnings is made at official rates and so may not measure the actual value of such provision to the recipients. A 1963 U.S. military survey showed that military personnel appraise "total income" at much less than the cost value calculated by Department of Defense accountants. In 1963, first year base pay for enlisted men was $1055, Defense Department defined total income was $1830 and perceived pay for all the military's cash, income-in-kind and deferred benefits was only $1550.[13] This perception difference can bias pay elasticity of supply estimates, depending upon whether the source of measured military income variation is cash or kind. Breakdown of total military income measures was not available to permit testing of this, though we note that the difficulty does not hold for Canada where the concept of a "military salary" has applied to military-earnings since 1966. A "military salary" was adopted in Australia in 1973 and effects the last four observations.

Civilian earnings were defined as average earnings of male employees, all industries. Again an earnings stream would have been desirable. But such data are not available on a continuing quarterly basis. The decision was made that current data reflecting changes in labor market conditions were more important than structural accuracy--particularly in view of the high discount rate of young men and the broad similarity of military and civilian earnings profiles,

except for the United States pre-1971 where first-term pay increased little until the re-engagement or committal point.

Inability to isolate age-specific income measures is probably a source of bias and inefficiency in estimation, due to likely divergence in earnings fluctuations between young men and older males. Difficulty also arises from our lack of knowledge of expectations. We simply do not know much about the extent to which individuals anticipate pay increases, though this is probably more important for the military income measure than our broad civilian earnings measure which is an average of the myriad of different wage rate movements in the civilian labor market.

Both civilian and military earnings are deflated by the consumer price index to provide a measure of real earnings, and are converted to indexes (1967=100).

The ratio of civilian to military pay can be employed as a single variable replacing separate military and civilian income variables. This has the advantage of avoiding multicollinearity problems in those countries where military pay is closely tied to average civilian pay movements, but the single (ratio) measure involves the implicit assumption of symmetric response to alternative income changes. The in-kind component of military income could well produce asymmetric response, as could a correlation between civilian pay and family income which would introduce an "income

effect" into the coefficient for civilian pay.[14]

It will be remembered that an assumption of constant variance and distribution of civilian earnings was made. An income distribution measure such as Gini coefficient or the variance of earnings could, in principle, be included to allow for possible violation of this assumption. But continuing data of this sort are not available on a quarterly basis, and for some countries age-specific income data are not available at all. The inclusion of a separate unemployment variable will operate as a proxy measure of fluctuations in the distribution of income. We expect little fundamental distributional change over our short period of analysis.

Unemployment

As a proxy for variation in civilian earnings, unemployment can be included separately and not just as an adjustment to civilian earnings. The unemployment rate variable adopted was the unemployment rate for young men aged 15-19, or the closest available age grouping in the official statistics. An excess demand for labor variable in the civilian labor market would have been a better variance or risk proxy, or even separate inclusion of a vacancies variable to test the job opportunities hypothesis of labor mobility,[15] but vacancies data are not age-specific even when available.

The product of average duration of unemployment and the unemployment rate might also have been an improvement,

in principle, but high correlation of the two variables means that there is little real incremental gain in explanation, as is shown in a recent study by J. C. Hause.[16] Moreover age-specific duration of unemployment data are not published for Britain and Canada on a quarterly basis.

Tastes

We are obliged to maintain our assumption of no change in the variance and distribution of relative tastes for the non-pecuniary aspects of military and civilian employment. There is almost no evidence on which to develop alternative assumptions. There is more evidence however on shifts in the mean level of tastes.

The best evidence available to this writer was for Britain, where an ongoing survey of the public's attitudes to defense has been carried out since April 1971 for the Ministry of Defense. The questions asked permitted one of three qualitative categories for an answer, so that significant distributional evidence is not obtained, but in examining the level of agreement to the questions, trends in the general level of support for military life can be evaluated. For Britain, for the 12 surveys conducted since April 1971, the major characteristic of the series is the relative stability of the response rates to most of the questions asked, and this is in spite of the situation in Northern

TABLE 4.2. TRENDS IN MILITARY TASTES, BRITAIN 1971-1974

Survey Date	Question 1: Armed Forces[1]				Question 2: Career[2]			
	% Response (absolute or fairly essential)		Sample Size (N)		% Response (very good or quite good career)		Sample Size (N)	
Age Group	16+	16-24	16+	16-24	16+	16-24	16+	16-24
April 1971	97	95	2196	393	94	91	2211	222
July 1971	94	91	2122	379	93	89	1455	215
Oct. 1971	97	93	966	351	94	90	1361	186
Jan. 1972	97	94	2032	367	94	89	1407	216
June 1972	96	95	2115	375	94	91	1385	196
Aug. 1972	97	94	2068	370	95	93	1401	214
Oct. 1972	96	94	2002	359	94	90	1369	204
Dec. 1972	97	95	1980	357	95	92	1312	200
Oct. 1973	96	95	1749	308	93	93	1082	137
Dec. 1973	96	95	1885	333	93	90	1318	206
Feb. 1974	94	94	2112	369	93	89	1439	202
May 1974	97	95	1920	351	92	93	1237	185

1. Question 1: "Would you say the Armed Forces are absolutely essential, fairly essential or not essential?"

2. Question 2: "What sort of career do you think the Armed Forces offer today; would you say it was a very good career, quite a good career, or not a very good career?"

Source: Ministry of Defence, London, 1974 (Unpublished result of surveys by NDP Market Research Limited for the Ministry).

Ireland (see Table 4.2). It is assumed that a similar result would obtain for Canada, since there has been no combat involvement of Canadian troops, or major restructuring of non-pecuniary conditions of service, over the period of our analysis.

Such an assumption can be applied without further investigation for Australia and the United States. The involvement of those two countries in the Vietnam conflict, with the associated trying living conditions and casualties for troops involved in the conflict, represent an important change in the objective conditions of military service during the period of that involvement. A variable such as casualty rates could serve as a measure of the influence of the Vietnam conflict upon taste changes. But this is a partial representation only.

A dummy variable could also be used for the period of Vietnam involvement. The method we have adopted however is to measure attitudes to the military as expressed in the proportion of favorable respondents in public opinion polls on "whether the U.S. (Australia) made a mistake in sending troops to Vietnam." This approach has the advantage of measuring attitudes directly and continuously, and of thereby reflecting changes in public opinion on military involvement in Vietnam in a way that a dummy variable cannot. A priori we might expect Vietnam to have been a positive

influence early in the War, through its appeal to patriotic, adventure, travel and pecuniary motivations for enlistment, but becoming less so as public doubts about the wisdom of the commitment increased. This, at least, is the hypothesis expressed to this writer by army recruiters in Australia and the United States, though to what extent such an effect overcame danger and discomfort disincentives to enlistment, even early in the War, is what is to be tested.

We recognize that such poll data is an imperfect measure for our purposes. Questions asked refer more to defense and foreign policy attitudes than to attitudes to military careers as such, and it is not possible to obtain continuous series for young men only. Extrapolation beyond 1972 is also arbitrary, employing linear interpolation through to a single "retrospective" question asked in both countries in late 1973.

Draft Probability

The probability of induction can be estimated as the number of quarterly inductions per 1000 males of draft-eligible age: 20 year olds for Australia and 18-24 year olds for the United States. The implied assumption is that individuals use current quarterly data to forecast their expectations about the probability of being drafted. Naturally no measure of draft probability is needed for Britain or Canada.

This draft probability measure is to be used to estimate the effect of the draft in inducing enlistments. Setting the draft at zero would then screen out draft-induced volunteer influences in examining the behavior of fully-volunteer force recruitment. If draft-induced enlistments are not allowed for in the estimation, the elasticity of supply will be biased downward.

An alternative procedure to use of a draft pressure variable is use responses of first-term servicemen to survey questionnaires to estimate the number induced to enlist by conscription. In the U.S., individuals in the services were asked whether they would have enlisted in the absence of a draft. The proportion who said "yes" or "probably yes," as opposed to "no" or "probably no," are classified as true volunteers and that proportion of respondents is then applied to total enlistments to estimate the true-volunteer and draft-induced components.[17] Regression equations can then be estimated using this adjusted enlistment variable thereby eliminating the need for a separate draft pressure variable.

There are a number of difficulties with this survey procedure. On the practical side survey results are only available for the U.S. and then only for the years of 1964 and 1968, so that adjusment of time series data is inhibited. The survey sample also differs between the two surveys, with personnel stationed overseas and Mental Group IV

enlistees being excluded from the second survey. On the conceptual side, there are the usual limitations of survey method--with what people say not necessarily being the same as what they do, and the standard problems of interpretation and structure of questions and answers applying. For example, some true volunteers whose expectations of military life have not been realized might now answer "no" to a question about their voluntary enlistment to cover up their bad judgment or earlier ignorance, or because their knowledge and perceptions have now been altered and it is difficult to answer a question from the perspective of one's previous outlook.

Also the surveys undertaken were restricted to volunteers. It is likely that draftees include men who would volunteer in the absence of a draft, but find it more convenient to be drafted--to let the draft make a decision for them, or to permit a shorter term of service and so find out about military life without a longer legal obligation to remain. In both Australia and the United States, individuals could in fact volunteer to be drafted before their final draft-service liability was otherwise determined. Also there may be individuals who were denied regular volunteer entry to the military but are accepted under separately administered induction standards.

For these reasons it seems preferable to employ the

direct draft pressure variable rather than a survey-based adjustment technique. The induction variable is an ongoing measure available for both countries and it is able to allow for the net impact upon enlistments of both draft induced volunteers and volunteer inductees. Data over our period of analysis also now has the advantage of including zero draft observations, so avoiding the suspect extrapolations to a zero draft environment that were necessary, at least for the United States, before 1973.

There does remain the difficulty with the U.S. draft pressure variable that draft calls are themselves dependent on the enlistment rate. Under the Selective Service system, state induction calls took into account the volunteer enlistment contribution of each state to the military.[18] In consequence the draft pressure variable is not truly exogenous, and is likely to involve simultaneous equations bias tending to bias the draft pressure elasticity estimate toward zero. This is not a problem for the Australian measure, since draft calls were set at a constant absolute amount for the whole period of operation of National Service, 1964-1972. A dummy variable is not employed for Australian conscription as changes in the size of the draft eligible population do alter the draft pressure that is implied by a constant absolute intake of draftees.

Quality Level

The measure employed for quality level of enlistees is the proportion of applicants who are enlisted into the military. The exception to this is the United States, for which the proportion of Mental Group IV enlistees (the lowest group accepted) in total enlistees is the measure. Complete uniformity of definition was not possible because the U.S. Department of Defense does not compile a comparable applications series, and mental group data were not available for the other countries.

The U.S. measure is probably superior since it measures the main dimension of quality variation directly. Physical fitness and character levels can be expected to change little in the short-run, whereas the mental quality offering and being accepted is likely to be subject to more fluctuation.

A difficulty in both estimates of the variable is that we cannot distinguish changes in quality minimum standards from changes in quality offers. Verbal enquiry indicated that there were no major official changes in minimum acceptable standards for any of the countries over the period of analysis. But we must recognize a reluctance to publicly acknowledge such changes (in either direction) by defense officials, and hence the possibility of some mis-interpretation if we treat variations as entirely due to quality offer changes.

For the non-U.S. measures there is the additional complication that many of the applicants who do not become enlistees are not rejected, but rather voluntarily withdraw or do not pursue their application. In Australia, this happens to about 20 percent of applications on average.[19] In Canada the figure is a little over 40 percent.[20] This proportion is troublesome since it is likely to vary with economic conditions, as reflected in civilian wages and unemployment, and with changes in enlistment standards originating with the services. The same can apply to the level of applications itself, and the outcome is further possible simultaneity bias. The effect of enlistment standards changes will be to produce a "discouraged applicant" effect, and it could operate quite informally even in periods of excess supply, where official minimum standards are not raised but applicants become aware of a lower probability of acceptance even if they meet minimum standards.

The quality level measure is still a useful and important element of the analysis however for, even if its behavioral interpretation is not completely clear, it is a ready indicator of the enlistments potential of deliberate changes in proportion of applicants (or Mental Group IVs) acceptable to the military i.e. the variable can be interpreted as an instrument variable for policy analysis.

It is also essential to incorporate this variable to account, even if imperfectly, for changes in quality offers as they relate to military manpower quotas. Thus we wish to estimate a supply curve for volunteers meeting a specified minimum standard. But in periods of excess demand or supply our observations may not be appropriate to that supply curve. To illustrate this point refer to Figure 4.2. There demand is fixed at D* and the supply curve for volunteers of a pre-determined quality level, is SS. A military wage of WM_E would equilibrate supply and demand, and point E would be observed. If $WM_1 > WM_E$ then, other things being equal, the military can choose higher quality applicants from the resultant queue under these excess supply conditions, and point A would be observed. A would represent a point on a supply curve, S'S', for a quality level higher than for the original curve, SS. If $WM_2 < WM_E$ then excess demand exists and the military may choose to meet its manpower requirements by lowering entry standards. This gives the observed point B on the lower quality level supply curve, S"S". It is only with the inclusion of a quality acceptance measure that we can infer the enlistment supply curve for a given quality level.

Other Variables

The use of seasonal dummy variables for the quarterly

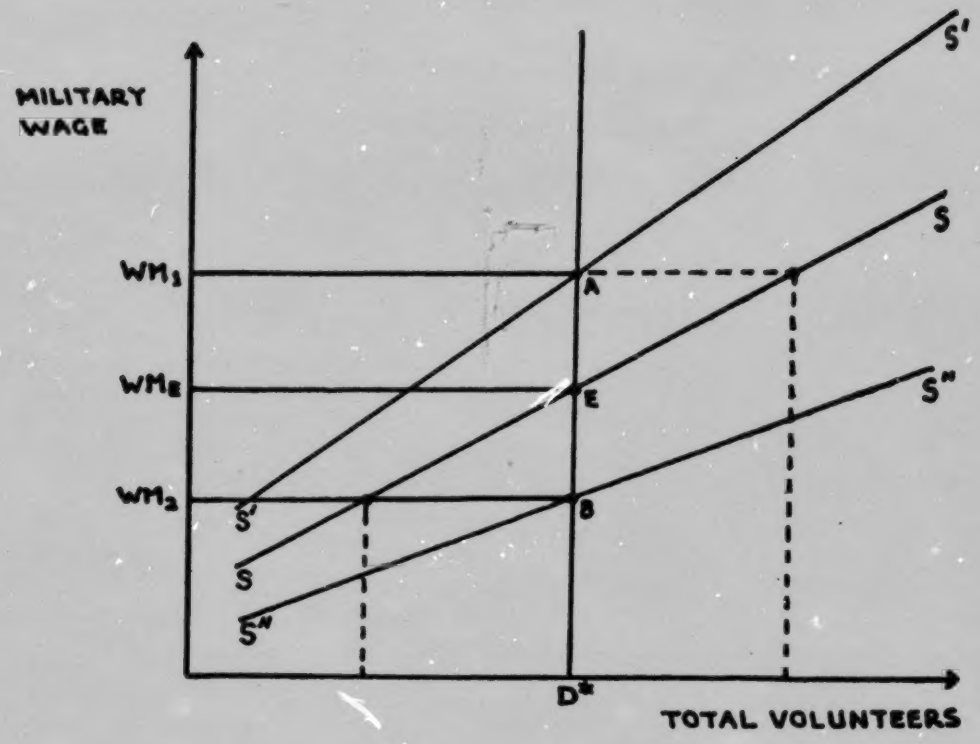

FIGURE 4-2. THE QUALITY ADJUSTED SUPPLY CURVE

data has already been discussed above. For the Canadian analysis, regional dummy variables were employed instead to control for any influence of differential taste factors between regions. Seasonal dummies were not relevant for the Canadian annual data.

The remaining variables employed relate to information about, or perceptions of, the nature of military life and military career opportunities. Unlike most civilian occupations, qua occupation, the military spends considerable money and effort on recruiting. This primarily takes the forms of recruiting personnel and of recruitment advertising. The intent is to improve individual's perceptions of the desirability of a military career and so produce a shift out in the military labor supply curve in relation to military wage. It is not necessary, or perhaps even possible, for such activities to create motivation for enlistment but rather, given the limited information processing and attention and retention capacity of most individuals, to remind people of available opportunities, inform them of specific details of military life and stimulate an existing interest.

To examine these effects is important both to improve over-all explanation of enlistments and because recruiting effort is a potentially important policy alternative to military wage changes in obtaining voluntary

enlistments. As estimates of recruiting effort we use either recruitment advertising expenditure (constant prices) or military personnel assigned to recruiting duties, both in relation to the size of the recruit population. Data could not be uniformly obtained for all services of all countries, which limits our ability to make comparisons and renders our conclusions in this area more tentative than for other variables. This is why recruiting effort has not been given a more prominent place in the analysis.

Empirical Results

A total of 26 Ordinary Least Squares regressions were run for the four countries: 8 each for Great Britain, United States and Australia, and 2 for Canada, along with two additional joint time-series cross-section regressions for Australia. The regressions examined the impact of the specified independent variables upon enlistment supply for the army and total defense, with different specifications of the pay variable and with the use of a distributed lag variable. Tables 4.3 to 4.7 summarize the results in terms of elasticities. Since a logarithmic form proved the most appropriate for all countries except the U.S., the elasticity interpretation was otherwise immediate. For the U.S., elasticities were evaluated at the mean values of the variables. For the equations with a lagged dependent variable, elasticities are "long-run" elasticities calculated by dividing the estimated

TABLE 4.3. ELASTICITIES OF ENLISTMENT SUPPLY: AUSTRALIA, QUARTERLY, 1966(3)-1973(4)

Variable: Equation	Relative Pay	Civilian Pay	Military Pay	Unemployment Rate	Quality Acceptance	Draft Pressure	Tastes	Recruiting Personnel Rate
Relative Pay Model								
1. Army, static	-0.27			0.34**	1.12**	0.02*	-0.001	0.01
2. Army, dynamic	-0.09			0.36**	1.14**	0.02	0.03	0.01
3. Defense, static	0.25			0.17*	0.93**	0.00	0.04	
4. Defense, dynamic	0.22			0.17	1.00**	0.01	0.02	
Absolute Pay Model								
5. Army, static		-0.95	0.09	0.37**	1.07**	0.02	-0.17	0.05
6. Army, dynamic		-0.72	-0.02	0.38**	1.10**	0.01	-0.11	0.04
7. Defense, static		0.13	-0.30	0.19	0.93**	0.00	0.00	
8. Defense, dynamic		0.01	-0.31	0.19	1.01**	0.00	-0.04	

*t – value significant at 0.10 level

**t – value significant at 0.05 level

TABLE 4.4. ELASTICITIES OF ENLISTMENT SUPPLY: GREAT BRITAIN, QUARTERLY, 1966(3)-1973(3)

Variable: Equation	Relative Pay	Civilian Pay	Military Pay	Unemployment Rate	Quality Acceptance	Advertising Rate
Relative Pay Model						
1. Army, static	-1.52**			0.90**	0.79**	-0.07
2. Army, dynamic	-1.24**			0.91**	0.71**	-0.07*
3. Defense, static	-1.58**			0.79**		
4. Defense, dynamic	-2.18**			0.85**		
Absolute Pay Model						
5. Army, static		-1.15	1.46**	0.90**	0.81**	-0.06
6. Army, dynamic		-0.49	1.11**	0.89**	0.74**	-0.05
7. Defense, static		-1.73*	1.59**	0.80**		
8. Defense, dynamic		-2.50**	2.04**	0.82**		

*t – value significant at 0.10 level

**t – value significant at 0.05 level

TABLE 4.5. ELASTICITIES OF ENLISTMENT SUPPLY: UNITED STATES, QUARTERLY, 1966(3)-1973(4)

Variable: Equation	Relative Pay	Civilian Pay	Military Pay	Unemployment Rate	Quality Acceptance	Draft Pressure	Tastes
Relative Pay Model							
1. Army, static	-0.28*			-0.28*	0.29**	0.18**	0.15
2. Army, dynamic	-1.39**			0.74**	0.25**	0.47**	0.43*
3. Defense, static	-0.52**			-0.39**	0.98**	0.05	0.28*
4. Defense, dynamic	-0.28*			-0.40**	0.59**	0.06*	0.27**
Absolute Pay Model							
5. Army, static		1.98	0.09	-0.19	0.28**	0.18**	0.18
6. Army, dynamic		3.03	0.33	0.26	0.44**	0.29**	0.33*
7. Defense, static		-1.43	0.45**	-0.38**	0.98**	0.05*	0.22*
8. Defense, dynamic		1.93	0.09	-0.32**	0.55**	0.07*	0.36**

*t – Value significant at 0.10 level

**t – value significant at 0.05 level

TABLE 4.6. ELASTICITIES OF ENLISTMENT SUPPLY: CANADA, ANNUAL BY REGION, 1969-1973

Variable: Equation	Relative Pay	Civilian Pay	Military Pay	Unemployment Rate	Quality Acceptance
Relative Pay Model					
1. Defense	-0.99			-0.29	0.96**
Absolute Pay Model					
2. Defense		-3.60	1.37	-0.00	1.09**

*t – value significant at 0.10 level **t – value significant at 0.05 level

TABLE 4.7. ELASTICITIES OF ENLISTMENT SUPPLY: AUSTRALIA, QUARTERLY BY STATE, 1966(3)-1973(3)

Variable: Equation	Relative Pay	Civilian Pay	Military Pay	Unemployment Rate	Quality Acceptance	Draft Pressure
Relative Pay Model						
1. Army, static	-1.48*			0.17	0.86	-0.004
Absolute Pay Model						
2. Army, static		-1.19	2.44**	0.16	0.90	0.04

*t – value significant at 0.10 level **t – value significant at 0.05 level

coefficients by one minus the coefficient of the lagged dependent variable. The complete regression results are given as Appendix Tables 4.1 to 4.5.

The coefficient of determination was uniformly high for all equations, ranging from .87 to .99 which, while we expect a reasonably high R^2 for time series data, is quite encouraging for a sectoral series in which most of the variables are expressed as ratios or rates. Most equations were adjusted for serial correlation. This, too, is to be expected for quarterly time-series data, though we note that, for the cases of equations without a lagged dependent variable, when the Durbin-Watson statistic produced an inconclusive result at the .05 level of significance with regard to the presence of serial correlation, we still corrected for serial correlation. This adjustment has little base in formal theory, but is common practice. The result may be, however, to underestimate the key pay, draft and unemployment elasticities,since this was the usual observed outcome of correction for serial correlation.

Quality

As regards the individual explanatory variables, the variable which is uniformly the most significant in terms of the t-statistic is the quality acceptance rate. It seems that much of the variation in the enlistment rate is accounted for by changes in minimum qualification standards, or the changing quality of labor offering. The sign of the variable is always positive, as expected, and its coefficient

is estimated to provide an elasticity (for Canada, Australia, and Britain) of around unity, as is also expected a priori. Indeed, it might have been assumed that this coefficient could be constrained to equal one: a one percent increase in applicants accepted should lead to a one percent increase in enlistments. This is not strictly true, however, since various demonstration effects may accompany changes in applicant acceptance. Given the extent to which many young men hear about military career opportunities informally through the experiences of their peers in applying for entry to the military[21], a higher than average rejection rate may well induce a change in the number applying for entry. This effect could conceivably operate in either direction: discouraging some who fear they will not make the grade, and encouraging others who see higher rejections as evidence of a more congenial and superior work environment. In the event, the net effect seems to be in Australia to encourage additional applications at the levels of quality acceptance operative over the period of analysis. The level of significance of the coefficient is very high. In Britain, on the other hand, both short run and long run estimated elasticities indicate a predominant discouragement effect under increasing enlistment standards and around the levels operative for Britain in this period. For Canada no clear bias away from unity is discernable, and for the United States net discouragement effect seems to have operated with regard to mental group IV for entry.

Unemployment

Another variable frequently found quite significant in contributing to enlistment rate variations was the unemployment rate. The clearest results obtain for Great Britain, where the elasticity of the enlistment rate with regard to the unemployment rate is uniformly estimated by all 8 equations as positive and within the range .79 - .91, indicating, as was expected, a positive effect of increasing unemployment upon enlistments. A similar effect is evident for Australia, although the elasticity estimate is smaller (over the range .17 to .38) with the higher values within the range being more significant and more associated with army than total defense. This bias towards higher elasticities for army enlistment was also evident for Britain, the explanation perhaps being that the navy deliberately seeks to attract younger recruits direct from school for long-term engagement and the air force attracts higher quality recruits with good civilian alternatives. It is the army which, with short service terms available, is more likely to receive applicants in connection with increasing unemployment. The lower absolute level of elasticity for Australia is consistent with Australia's experience of continued full employment since World War II. The Australian unemployed will have more confidence in being able to obtain a job in the near future. This very fact warns against using the Australian parameter estimates for large increases in unemployment beyond the accustomed (low) range, where the

unfamiliar insecurity may produce a flood of applicants to the military.

The Canadian and American experiences require different interpretation. This is most understandable for the Canadian case, since the quality acceptance variable is the only variable significant, even at the .10 level, in explaining the enlistment rate. This conforms to the fact that the Canadian military is the smallest (relatively) in the four countries being considered, and also the best paid relative to domestic civilian incomes. It seems that the Canadian military has long operated with an excess of applicants meeting minimum required standards. The result is, as has been stated, that "attracting recruits has posed no problem in Canada, and recruiting officers suggest that the number of enlistments could be doubled or tripled with no difficulty."[22] For the same reason, the Canadian regressions provide insignificant estimates for the pay coefficients.

For the United States, the army-defense dichotomy is supported, but in an unusual way, in that the negative army elasticities are larger than the defense elasticities. The American results show that the coefficients for unemployment are generally significant at the .05 level, and that they are usually negative. This is particularly so for defense, and the two estimates which are positive and insignificant are for army, implying perhaps that more individuals do apply to army as unemployment rises than to the other services. This, of course, does not explain the

anomaly of generally negative elasticities: enlistment decreasing as unemployment rises. The conceivable rationalization is that as unemployment rises, those being laid off first are not acceptable material to the military and are thus rejected. As unemployment decreases, on the other hand, more people may be willing to quit jobs and investigate new careers than otherwise. And these people would be likely to be of acceptable quality. But this should equally apply to Britain and Australia, unless American entrance standards became artificially high under a period of long resort to a draft.

A recent literature typified by Hall and by Feldstein[23] has argued that unemployment in the United States is not high due to insufficient vacancies or job loss, but because of voluntary separations and withdrawals associated with the secondary labor market of women, youths, and blacks. In part these problems do not apply to Australia and Britain, because education is more vocation oriented with less emphasis upon formal academic qualifications. Also, the more considerable unionization of labor in both Britain and Australia and a greater emphasis upon working conditions probably have meant less of a dual labor market than for the United States, with a reduction in the annual high turnover volume of unemployment in the secondary labor market. Finally, the structural problems with regard to youth and minorities are less for Britain and Australia. Britain, for various reasons, does not have the same age structure problems as the United States, and Australia has not had a similar minority problem.

Draft Pressure

The draft pressure variable applied only to the United States and Australia. The Australian result is that in 8 equations the induction rate is found statistically significant only twice, and then only at the .10 level, and in all cases the value of the elasticity of enlistment supply is quite small, though we note that the coefficient is larger for the army (.01-.02) than for all defense enlistment (.00-.01), as would be expected. These elasticity parameter estimates reflect observations which include reduction of a draft to zero, so that the implication is little draft-induced enlistment into the Australian military--perhaps of the order of 2% net increase in army enlistments over the period of operation of the draft. The result is not unexpected on a priori grounds, since the Australian draft took only a small percentage of young men, and used a 20th birthday ballot which induced most men to take a chance on being drafted. Also there were few pay, promotion or occupational specialty benefits to be gained through voluntary enlistment as opposed to being drafted in Australia.

The United States' parameters, on the other hand, yield significant estimated coefficients implying higher elasticities. The elasticities are positive, as expected, ranging from .21-.44 for the army, according to which model is adopted. This is compatable with the survey evidence used in the Gates Commission studies for their army estimates,

but the range of elasticity estimates derived for total defense enlistments (.05-.07) is much lower and is less significant than we would expect from the survey responses. The surveys indicated that around one-third of total defense enlistments were draft induced.

A greater proportion of volunteer draftees can hardly be the explanation of this, since that should be a greater effect for the army. The problems with survey response and any general problems of under-estimation bias should not affect army and total defense enlistments differentially. We do expect the draft-induced effect on total enlistments to be less than for the army, since the army offered shorter terms of service and greater opportunities for rank and pay advancements for the non-careerist, but the extent of the difference indicated in the coefficients still does seem large. It is a gap however supported by the other available time series analyses, over different periods, which also did not use the survey results to adjust for draft pressure.[24]

Tastes

We assumed constant tastes for Britain and Canada, and attempted to measure changes in the average level of relative tastes for the military in Australia and the United States using a public opinion variable which measured public attitudes to Vietnam involvement. In six of the eight United States equations the taste parameter was positively significant at

least at the .10 level, and the elasticity was estimated as being within the range .15-.43. There seemed no clear difference in impact between the army and defense. The implication is that participation in Vietnam actually encouraged net enlistments. It should be remembered in interpreting the magnitude of this elasticity effect that the public opinion variable fell to a base level defined by the sample response at the time the last Gallup question on this topic was asked. The fall from the Vietnam period average response to the post-Vietnam base response implies an average positive effect of 3.9 per cent on enlistments.

In Australia the public opinion parameter estimates are not significant in any of the eight equations, are not consistent in sign, and produce estimates of elasticity of quite small magnitude. This result is consistent with the differing domestic experience in relation to the Vietnam war between the U.S. and Australia. In Australia, participation in the Vietnam war was exceedingly controversial from the beginning, even before conscript troops were committed to service in Vietnam. The use of Australian troops directly violated strongly held Labour Party foreign policy beliefs, and Labour opposition to Vietnam involvement was violent and trenchant. There was not, therefore, a period in Australia when service in Vietnam was not under question, so that patriotic motives for enlistment would be considerably dimmed. Australian experience in jungle and guerilla warfare in New Guinea, Malaysia and Indonesia also left few

public illusions as to the difficulties to be faced in Vietnam, so that any thoughts of adventurism in enlisting would also be reduced. Australian overseas service-allowances and benefits are also quite minimal compared to U.S. provisions.

In the United States, public opposition to the war never really developed until after the 1968 Tet Offensive, and American recognition of the true nature of an insurgent civil war was longer in coming. The result was a period when patriotic, adventure and pecuniary motives would join to encourage enlistment and so produce an average positive influence upon enlistment. The exact level of this effect implied for the United States may not, however, be that given by our estimates, since there is likely to be some collinearity between draft pressure and the Vietnam public opinion variable. The simple partial correlation coefficient is .77, and exclusion of either the draft or taste variable in estimation does increase the size of the remaining coefficient and its statistical significance, which may also be a contributing factor to the seeming under-estimation of the defense draft induction variable noted above.

Pay

The alternative pay specifications tested were absolute pay and relative pay. The British results here are the neatest. The relative pay coefficients are all negatively significant, and provide an elasticity of the order of -1.50.

The absolute pay coefficients are also significant at least at the .1 level for six of the eight equations. The signs are, as expected, negative for civilian pay and positive for military pay, and the associated elasticity estimates cluster around -1.50, with a tendency for defense elasticities to be a little higher than for army alone.

The Canadian pay elasticities estimated are of expected sign and of acceptable magnitude, but have relatively low t-values, for the excess supply reasons already discussed. When an excess supply is maintained on a continuing basis, a quality acceptance variable cannot adequately remove the influence of this situation upon the psychology of applicants for enlistment. Higher wages, for instance, could encourage more applications from those who had good civilian opportunities but at the same time may discourage applications from less qualified individuals who knew getting into the military was difficult before, and would be even more so now.

In the United States, the relative pay coefficients are negative and significant at the .1 level or better. The magnitude of the implied elasticity, evaluated at the means, ranges from -0.28 to -1.39. The absolute pay coefficients are only significant in one case out of eight and have the wrong sign for three civilian pay coefficients. A key problem seems to be collinearity between military and civilian

pay: The partial correlation coefficient is .85. The only major variation between the two pay measures came with the 1971(4) military pay increase associated with the transition to all-volunteer forces, and even this probably underestimates the impact of pay on enlistment supply due to a potential "errors-in-variables" problem. The military pay increase represented the first competitive (as distinct from equity) wage adjustment in recruit pay for many years. Many young men may not have accepted the increase as a permanent change in pay relativity.

For Australia, not only is there a collinearity problem between military and civilian pay producing unstable and imprecise estimates of the absolute pay coefficients, but there is also a problem with the relative pay coefficient estimates which have quite low t-values (the largest is $t = .47$) and, in two cases, the "wrong" sign. The problem here would seem to be insufficient wage variation. Military wages in Australia have long been directly tied to movements in civilian wages. Changes in the national wage determinations of the Arbitration Commission, which affect all civilian wages, are also passed on automatically, and by the same amount, into military wages. Even changes in individual civilian skill margins awarded by the Arbitration Commission are incorporated into the military wage structure for comparable skills. The only divergence comes with

civilian over-award and overtime payments (for which the military attempts to compensate with an adjustable service allowance) and with deliberate recruiting changes in military pay. Again, as for the United States, only one recruiting directed major pay change took place (1972(1)), and its impact was soon lost as the new relativity was not maintained, and civilian pay increases were permitted to catch up to re-establish the previous relativity. Again, no "permanent" change in military income took place.

Another factor common to both the United States and Australia is that the major pay increases for the military took place at a time when the public opinion variables measured changes in the attitudes of young men towards the military most imperfectly. The Gallup Poll questions ceased with Vietnam involvement except for two follow-up questions. Between the end of the war and the follow-up questions, linear interpolation was adopted. Onwards from the time of the follow-up questions, constancy of tastes was assumed. Adverse reaction to the military for a period after Vietnam could, however, have meant a continued deterioration in tastes until young men of an age for which Vietnam was not an important issue reached the potential applicant population.

Fortunately, we have some extra sample evidence that income elasticities of supply are higher and more reliable than these quarterly time-series results for the

United States and Australia would indicate. First, earlier regression analyses on a quarterly time-series basis for these countries over earlier periods with more wage variability do indicate more satisfactory results.[25] Second, the British results for a stable peacetime environment are also encouraging, as we have seen. Third, two cross-section time-series regressions were run for Australia over the same data period and with the same wage and enlistment data as for the national time-series analysis, except that we were able to disaggregate the series by state. The results of these regressions were given above in Table 4.7. The regression method was ordinary least squares with individual constant terms, and analysis of covariance indicated that the hypothesis of homogeneous slopes could not be rejected, but that the hypothesis of homogeneity in intercepts could be rejected, on the basis of F-tests at the 95 percent level of confidence.

The resultant parameter estimates indicate a highly significant negative coefficient with elasticity of -1.48 for relative pay. The absolute pay coefficients are also highly significant, of expected sign and of greater magnitude than before: -1.19 for civilian pay, and 2.44 for military pay.

Other Variables

The recruitment personnel and advertising rate variables employed in the British and Australian estimations did not produce estimates of coefficients significantly different from zero. It would be unwise to conclude that a zero recruiting

effort would not affect enlistments. The insignificant coefficient estimates could well only indicate low marginal effectiveness around prevailing levels of effort. It may be for instance that a certain "floor" level of activity is necessary to maintain public awareness even if beyond this point there are rapidly diminishing returns to additional recruiting efforts.

The coefficients and levels of significance found for the seasonal dummy variables were consistent with the enlistment pattern that would be expected due to the timing of the school year.

The enlistment-term dummy variable employed for Great Britain was not highly significant, but did uniformly indicate as its parameter estimate a small negative impact upon the enlistment rate as a result of introducing a new shorter enlistment period.

The lagged dependent variable was not statistically significant for the Australian estimates. It was significant only at the .15 level for British estimates, and quite significant for the United States equations. This result is consistent with our knowledge of the rapidity of adjustments in the labor markets of the three countries, with the Australian case being one of a very homogeneous and highly concentrated urban labor market, and the larger, more complex and more heterogeneous British and American economies producing greater information and mobility adjustment lags. In

several instances negative lag coefficients were obtained, indicating that induced enlistments in one quarter may come partly at the expense of later enlistments.

FEASIBILITY IN MANPOWER PROCUREMENT

The econometric results outlined in the previous section can be used to assess the feasibility of all-volunteer recruitment. There is, of course, no question about the feasibility of draft procurement since this is a matter of legislative or administrative decree.

To analyze the volunteer enlistments forthcoming under various specified conditions, the appropriate model must be chosen - in general the relative pay model for army enlistments, using a lag, seems most appropriate. The lag would be less justifiable for forecasting since it may build in cumulative error, but it is valid for comparative statics exercises. The army equation is chosen because conscription is usually for the army. The defense equations were made in the earlier analysis to permit comparability with the Canadian results and in order to examine draft-induced enlistment impacts on the other services.

We can bring together the chosen supply equation and the demand estimates given in Chapter 3, to illustrate the conditions under which a free military labor market can be cleared, and fully voluntary enlistments obtained. It is assumed that pay is the only policy variable. Quality

acceptance and unemployment variables are set at their average levels over the period of analysis. The public opinion variables remain constant at their 1973 values, and induction rates are set at zero. The lagged independent variable is set at the desired enlistment rate to replicate a steady state position for the required accessions for the United States. For Australia we use the joint cross-section time-series equation as our estatimator. The estimates reported are an annual average so that we average out the seasonal influences.

Since all variables except the relative wage are specified, we can readily solve for the market clearing wage, and by comparing that with the relative wage appropriate to lower levels of manpower requirements, and assuming a constant civilian wage at its average level over the data period, we can calculate the increase in military income required to establish an all-volunteer force at the specified levels.

The results for the volunteer accessions requirements derived in Table 3.4, and under the conditions specified, are given in Table 4.8. We note that other assumptions as to unemployment, tastes and quality level could alter the required military income. A presumed return to normal tastes after an adverse Vietnam transition could be built into the estimates, as could a policy decision on lower minimum acceptable quality levels.

TABLE 4.8

REQUIRED MILITARY INCOME - STEADY STATE

(Given Military Effectiveness Level)

U. S. Accessions		Australian Accessions	
	Required Income[1]		Required Income[2]
Mixed Force	($)	Mixed Force	($)
1. 251,430	2162	1. 10,400	3349
Volunteer Force		Volunteer Force	
1. 133,110	3231	1. 4,480	6263
2. 114,840	2957	2. 3,840	4772
3. 110,490	2897	3. 3,360	4253

1. $U.S. (1970) p.a.

2. $A (1970) p.a.

TABLE 4.9

NET WAGES COST - STEADY STATE
(Given Military Effectiveness Level)

U.S. FORCE STRENGTH		AUSTRALIAN FORCE STRENGTH	
	Wages Cost[1]		Wages Cost[2]
Mixed Force		Mixed Force	
1. 870,000	1794m.	1. 40,000	134m.
Volunteer Force*		Volunteer Force*	
1. 804,750	2600m.	1. 36,000	225m.
2. 804,750	2380m.	2. 36,000	170m.
3. 804,750	2331m.	3. 36,000	153m.

1. $U.S. (1970) p.a.

2. $A (1970) p.a.

* Volunteer Forces are differentiated by their first-term personnel to career personnel ratio.

To compare the government budget cost implications of an all-volunteer force with those of a force using the draft, the associated military income figures should be applied to the respective force strengths to find total wages cost. The mixed-force will have more men, but a lower required income. The net outcome, of course, depends upon the assumed level of pay under a draft, and the form all-volunteer pay increases take, e.g. an enlistment bonus, a graduated absolute increase for all ranks, an absolute increase for all ranks, or a fixed percentage increase for all ranks. Adjustments would need to be made for tax effects on government revenue under the alternative systems, and for non-wage costs that may differ between the procurement systems (e.g. materiel and other supply and travel costs). A full steady state analysis will also incorporate long-run seniority and retirement pay effects.

A comparison which calculates net wage costs only, for the force levels given in Table 3.4, is given here as Table 4.9 by way of illustration. We assume a constant absolute increase for all army personnel. It would also be necessary to take account of the payment of higher income to the other services if pay uniformity is demanded, though on economic grounds it is more efficient for each service to set its own market-clearing wage and to minimize the payment of economic rents to the other services.

It is apparent that, while feasible, all-volunteer

forces may usually be expected to cost more in budgetary outlay than mixed forces. The strength reduction made possible under a volunteer force will usually be more than offset by pay increases required, although in some cases the size of the non-effective force difference between the systems, and the elasticities of supply may render a volunteer force even cheaper than a draft. Of course, under a draft system the military wage paid can always be reduced by administrative fiat, thus bringing budget cost below that for a volunteer force. It has often been common practice for some countries to pay draftees less than volunteer recruits, although this was not a system adopted by Australia or the United States.

CHAPTER 5: EVALUATION OF ALTERNATIVE PROCUREMENT SYSTEMS

> "The least evil, in case seamen be wanted, is to give them such wages as will induce them to enlist voluntarily. Let this evil be divided among the whole nation, by an equal tax to pay such wages."
>
> Benjamin Franklin, Remarks on Judge Foster's Argument in Favor of the Right of Impressing Seamen, 1762

One is led naturally from consideration of feasibility to evaluation of the desirability of an all-volunteer system as opposed to the draft alternative. A range of criteria can be advanced for such a judgement, extending from issues of economic efficiency, through equity, to concern for the prevention of a military takeover of government. A meaningful assessment of a draft vs. a volunteer system does require statement of the major issues that have been raised. We attempt to do this and to provide an appropriate context for decision. But the major focus is on elaborating those topics for which economic methods seem especially appropriate, viz. the criteria of allocation, distribution and flexibility. It is to these that initial and detailed attention is devoted before turning to those other issues which, without being any less important, seem less amenable to new insights through economic analysis.

The evaluation is advanced specifically for the situation of manpower procurement for a peacetime professional

standing military. The country is assumed to not be involved in a major war or to be faced with a perceptible threat to its territory. The balance of advantages between procurement systems may well change with a shift to a more hostile military situation. In the dimension of distribution, for instance, what may be a highly unequal distribution of burden for a peacetime military could become both fair and administratively convenient when full-scale mobilisation is called for. It is believed that the framework of evaluation advanced here can be adapted, if desired, to analyse these alternative strategic situations.

ALLOCATIVE EFFECTS

We commence evaluation with the allocative efficiency aspects of the alternative procurement systems. This is an area conventionally the province of economic analysis. It is also an area where the presumption tends to favor a volunteer system. Much of neoclassical theory is devoted to demonstrating the correspondence between competitive markets and (Pareto) optimal allocation. It is not surprising therefore that we take the volunteer recruitment system as the reference base and consider allocational losses that arise if there is intervention in the military labor market through a draft. Few counter claims are made for a draft on allocational efficiency grounds. Those who support a peacetime draft tend to lay their emphasis elsewhere.

Before we consider the worth of such alternative criteria we must be fully informed on allocative effects that we may wish to trade-off for other advantages. We distinguish four types of allocative effect: turnover differences, substitution and monopsony costs, uncertainty and avoidance effects and preference abrogation problems. We examine these effects from the viewpoint of comparative statics, and with reference to the recent draft experience of Australia and the United States. The concern is inevitably with the problems of a draft here since our criterion for allocational efficiency is the competitive market outcome.

Labor Turnover.

We refer here to the effect of alternative procurement systems on the accession rates required to maintain a given combat capability. It was demonstrated in Chapter 3 that a volunteer force requires considerably fewer accessions to maintain given military effectiveness. The advantage derived from the longer term of service of volunteers and the lower proportion of non-combat related postings required in such a system.

The allocative expression of this difference is the civilian production foregone, without gain in military effectiveness, by adoption of a draft system. If we assume the same earnings potential for military personnel as for similarly qualified civilians, we can readily calculate the

foregone income for the increase in the "non-effective" force strength under a draft. Assuming wage equal to marginal value product in the civilian economy, this loss has been calculated elsewhere, by way of illustration, as $A 19 million (1970),[1] and, for the U.S. draft prior to the Vietnam build-up, the loss has been estimated at $790 million (1970).[2]

There is another cost that could be associated with the high turnover of manpower under a draft system, and that is the contribution that such movement in and out of the forces makes to frictional unemployment. Apart from the obvious induction and re-establishment lags, necessary as a matter of logistics, there is also a problem for veterans in foregoing several years of civilian work experience and positions on promotion ladders in internal labor markets, as well as other training and education. Despite preferential hiring of veterans by the government, the result has been traditionally a significantly higher unemployment rate for veterans than non-veterans, and hence an increase in the overall level of unemployment. This is seen in Table 5.1.

We should note that veterans do have a greater incentive for prolongation of job search by virtue of more comprehensive unemployment insurance compensation--but an offset on the other side would be the expected employment difficulties of those non-veterans who had been rejected for military service due to failure to meet military enlistment standards

TABLE 5.1. EMPLOYMENT STATUS OF VETERANS AND NON-VETERANS

-U.S. MALES, 20-29 YEARS OLD, 1969-1972

(Numbers in Thousands)

Employment status	20 to 24 years				Total, 20 to 29 years			
	1969	1970	1971	1972	1969	1970	1971	1972
ALL RACES								
Veterans								
ivilian noninstitutional population---	1,573	1,795	1,953	1,935	2,316	3,436	4,057	4,538
Civilian labor force----------	1,436	1,621	1,736	1,752	2,152	3,187	3,714	4,206
Labor force participation rate------	91.3	90.3	88.9	90.5	92.9	92.8	91.6	92.7
Employed----------	1,357	1,470	1,524	1,566	2,038	2,968	3,388	3,898
Unemployed----------	79	151	212	186	114	219	326	308
Unemployment rate----------	5.5	9.3	12.2	10.6	4.5	6.9	8.8	7.3
Not in labor force----------	137	174	217	183	164	249	343	332
Nonveterans								
ivilian noninstitutional population---	4,729	5,024	5,499	6,039	8,521	8,885	9,391	10,007
Civilian labor force----------	3,774	4,058	4,448	4,942	7,405	7,736	8,143	8,702
Labor force participation rate------	79.8	80.8	80.9	81.8	86.9	87.1	86.7	87.0
Employed----------	3,584	3,732	4,026	4,510	7.141	7,269	7,549	8.113
Unemployed----------	190	326	422	432	264	467	594	589
Unemployment rate----------	5.0	8.0	9.5	8.7	3.6	6.0	7.3	6.8
Not in labor force----------	955	966	1,051	1,097	1,116	1,149	1,248	1,305

Source: Manpower Report of the President, 1971, 1973.

and who are thereby channelled into the high unemployment secondary labor market in the civilian dual labor market structure.[3] With the end of the Vietnam commitment and of the draft, and with the generous funding given the Jobs for Veterans program since 1972 (including one-to-one training), the unemployment rate for veterans is beginning to approximate that for non-veterans for the first time in some years.

There are also uncertainty costs that contribute to frictional unemployment in the presence of a draft, and these are the unwillingness of employers to hire draft-liable individuals and the unwillingness of individuals to commit themselves to occupational and educational choices until they are certain as to their draft position. In a 1964 U.S. survey, 20 percent of enlisted personnel interviewed indicated that they were told they could not be hired because they might be drafted. In answer to a separate question, 21 percent of enlisted personnel indicated that they had difficulties in career planning and life-choices because of the uncertainty as to whether they would be drafted (Table 5.2).

The arguments just considered tend to indicate that the operation of a draft system produces more frictional unemployment than a volunteer system would. But what if the problem is deficient aggregate demand causing unemployment? Then it may be argued that a draft operates as a system of "public employment" for young men, and so reduces their level

TABLE 5.2. DIFFICULTIES WITH EMPLOYERS AND CAREER CHOICE EXPERIENCED BY ENLISTED PERSONNEL PRIOR TO MILITARY SERVICE

Age of Entry	Educational level			
	All Educational Levels Combined	High School Graduate or Less	Some College No Degree	College Graduate
	Per cent who were told they could not be hired because they might be drafted			
Difficulty in employment				
All ages[a]	20%	17%	35%	40%
17-18 years	11	11	18	-
19-21 years	27	25	34	b
22-25 years	39	34	47	45
	Per cent of men who had difficulties because they were uncertain as to whether they would be drafted			
Difficulty from draft uncertainty				
All ages[a]	21%	16%	43%	51%
17-18 years	8	8	15	-
19-21 years	28	24	40	b
22-25 years	54	49	66	69

[a] Includes small numbers of men who entered service over age 25.
[b] Insufficient data to warrant separate presentation.

Source: U.S. Bureau of Census, Current Population Survey, October 1964, as reported by Harold Wool, "Selected Tables from Surveys of the United States Military Age Population, Oct-Dec. 1964", in N.A.B. Wilson, (ed.), Manpower Research, London: English Universities Press, 1969, p.245.

of unemployment below that which would prevail with an all-volunteer military. Indeed public employment of this form, with its compelled employment at below market wages, can avoid the problem, often associated with other public employment, of its funding merely replacing other employment to which that finance would have been devoted. In this case the same funding, or less, is used to employ more people than would be the case with the volunteer alternative, even though the cost of that volunteer military is itself reduced as unemployment rises. Charles Killingsworth has argued that as much of the post 1964 fall in unemployment is due to the armed forces build-up as to the 1964 tax cut.[4]

Substitution vs. Monopsony Costs.

The second category of allocative losses was the incentive offered by the apparent cheapness of military labor under the draft, to misallocate resources in a labor intensive direction. This effect, of course, is only of importance to the extent that political and bureaucratic decision-makers respond to price effects. To the extent that they do we can illustrate the welfare loss that would result in Figure 5.1.

The DD curve is assumed to represent the marginal social value of military labor. SS is the supply curve of labor to the military under a draft, and S'S' is the competitive free market supply curve. The free market level of employment is

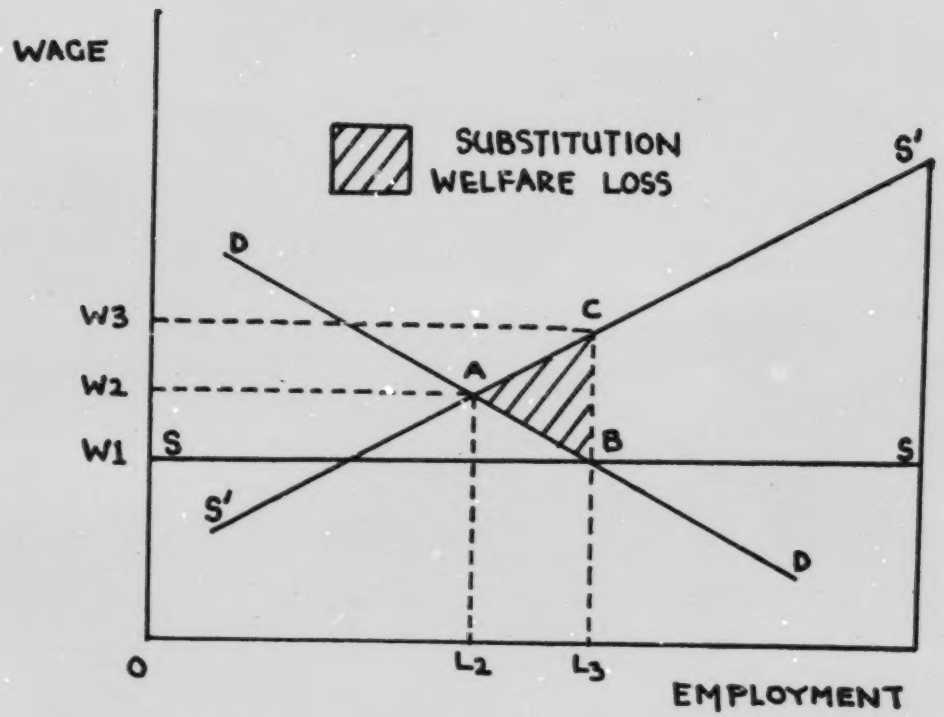

FIGURE 5.1. THE SUBSTITUTION LOSS UNDER CONSCRIPTION

L_2 at wage w_2, where as the draft level of employment is L_3 at wage w_1. w_3 is the wage that would be required to attract voluntarily the with-draft supply of L_3.

With linear demand and supply curves, the substitution loss equals $1/2(w_3-w_1)(L_3-L_2)$, by the rule for the area of a triangle.[5] Since $(w_3-w_1)L_3$ is a measure of the gross subsidy value of conscription for force strength L_3, we can simplify the welfare loss to:

$$S = 1/2 - (L_2/2L_3) \qquad (1)$$

This expression readily permits representation of the substitution loss as a proportion of the gross subsidy value of conscription and as a function of relative manpower demand:

L_3/L_2	.00	.25	.50	.75	1.00
S	.50	.38	.25	.13	.00

Any such welfare loss occasioned by the below-market price of labor, however, must be set against the welfare loss that would accompany a full-volunteer force, if the military acted as a monopsonistic purchaser. The military is the nation's largest single employer, for both Australia and the United States, and it is in a position to recognise that the supply curve of labor is not perfectly elastic in a free labor market. There is inter-service rivalry, but it does

not extend to competition over wages and other pecuniary remuneration, so that the services are bound together in purchasing labor. Unless wage discrimination is permitted, as with a variable enlistment bonus such as is currently paid to combat specialty enlistees in the U.S., monopsonistic purchasing behavior is a distinct possibility.

The position is illustrated in Figure 5.2, which incorporates an additional supply schedule S"S". This new schedule is the marginal supply curve, reflecting marginal wage cost as recognised by the monopsonist. A military constrained to competitive behavior would employ OL_2 at w_2, but a monopsonist military would restrict employment further to OL_1, at wage w_1. The monopsonistic welfare loss is given by triangle AFG. The relative size of the two welfare losses depends upon the exact form of the demand function and the supply schedule.[6] We do have some quantitative knowledge of the supply curve, but what of the demand curve?

In the absence of comprehensive and publicly available measures of military effectiveness (output) this question cannot be answered categorically. However it does seem that existing institutions and procedures may not be such as to foster economically efficient resource allocation and management--and, indeed, may well impede it. While lacking detailed institutional knowledge we may well illustrate this point for labor demand by reference to a recent official

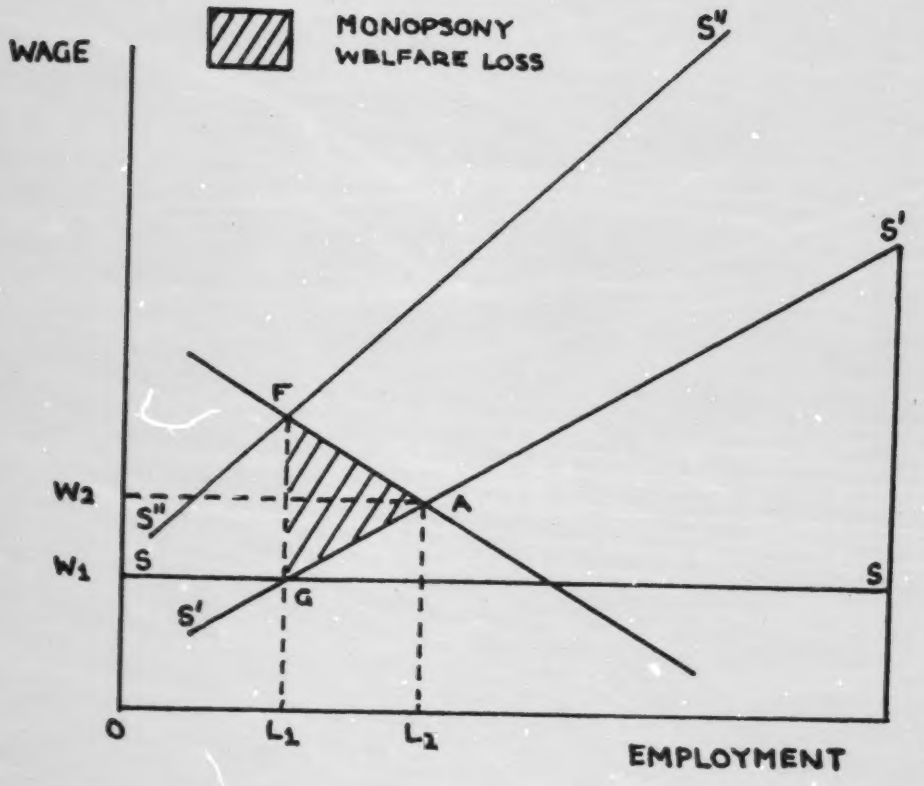

FIGURE 5.2. THE MONOPSONY WELFARE LOSS UNDER VOLUNTARISM.

outline for Britain, entitled "Forecasting for the forces: Manpower planning in the Ministry of Defence" (Dept. of Employment, Gazette, Jan. 1974):

> Manpower planning which is essential for both service planning and long term costings purposes, is required if the objectives of defence policy are to be achieved. The first step in the planning of manpower is a translation of this objective into manpower demands. Present and future commitments require a particular level of military capability which is converted into elements of army, naval or air-force presence such as battalions or squadrons and their equipment....
>
> The detailed process of forecasting manpower follows the same broad pattern for all three services. By way of illustration, the operational steps for the Royal Air Force are as follows. Squadron patterns for a ten-year period are produced. These are broken down into numbers of established posts through the application of scales related to the amount of activity....
>
> When the sequence of converting commitments to a multiplicity of forecasts of actual posts is completed, they are aggregated to a total demand forecast analyzed by trade and rank....Having arrived at an estimate of manpower demand, the rest of the planning process lies in considering how to meet it.

We note the following with respect to these planning arrangements:

1. Failure to consider substitution possibilities between Services, between capital and labor and between different types of labor; fixed coefficient requirements determination is implied throughout.

2. Failure to relate requirements planning to costs; costing is left as a separate (civilian and clerical) operation.

3. Failure to integrate supply and demand analysis; manpower requirements policy is separated from and prior to

personnel (supply) policy with no provision for interaction. It is only when total requirements are aggregated into Service budgets that there is a general concern for costs, and then something has to give: presumably military requirements. The likely outcome is for cost factors to produce gross adjustments in force structure (and hence unanalyzed risk with regard to the feasibility of objectives) rather than to re-allocate resources within a force.

It is likely then that military manpower demand under current bureaucratic systems may be relatively wage inelastic--except perhaps for very large shifts in the relative wage if these were to accompany, say, the adoption of an all-volunteer force. Such a system change could induce management review of substitution possibilities for reducing military manpower requirements. But otherwise the scale of adjustment to factor-price changes may well be small. As R.W. McKean has put it, such price changes "would not give any official new rights to take-home rewards for greater efficiency.... In other government agencies we already have a volunteer system, but it is by no means clear that efficient combinations of land, labor and capital are typically selected."[7]

In all it seems that with monopsony and substitution losses operating to offset each other, and with the demand curve for labor possibly quite inelastic, the allocative losses in this second category are probably quite small.

Preference Abrogation.

Turnover welfare effects were associated with a shift in the demand curve as between volunteer and draft

procurement systems. Substitution and monopsony costs arose in connection with an elastic demand curve for labor. A third category of allocative costs can now be distinguished if we assume labor demand fixed exogenously, and examine instead the significance of the labor supply curve for evaluating the allocative implications of a draft.

The supply curve of military labor incorporates both the alternative worth of resources to the civilian economy and tastes for military service. Accordingly, a measure of welfare loss due to coercion under conscription is given by the difference between the set of reservation prices of those in the military under a draft system and the lowest set of reservation prices which would generate the same number of men meeting military entrance standards in the absence of a draft.

A narrower definition proposed by W. Lee Hansen and Burton Weisbrod, and also by J. Ronnie Davis and Neil Polomba,[8] is the difference between the current foregone civilian opportunities and the lowest civilian opportunity cost consistent with the same number of men. This definition strips the supply curve of utility and looks only at productivity. But it will be remembered that it is the pursuit of "utility," as individuals themselves see it, that is held to be the whole point and justification of a voluntary system. Production is not pursued for production's sake. It is undertaken to meet the basic material requirements

of life and, above that, to cater to people's own subjective views of their wants and needs. The belief is that these desires are best catered to by a system which permits free choice by individuals in consumption and production. Since conscription involves denial of free occupational choice for the period of service, it is appropriate to stress the utility losses that result. This notion of psychic losses is at the heart of economic organisation and is not to be considered less "real" than argument in terms of direct material production. It is not production, but the "satisfaction " we obtain in production and from production, that is to be regarded as relevant and real. Accordingly, it is preferable to retain the broader definition of welfare loss that has been advanced.

To illustrate this welfare loss conveniently, let us further assume: a lottery draft, a linear supply curve of labor, and no draft induced enlistments. The situation is pictured in Figure 5.3 where the eligible manpower pool is L_3, the exogenous demand for military labor is L_2, and the volunteer supply of labor forthcoming at the offered military wage, W_1, is L_1; $(L_3>L_2>L_1)$. The draft requirement is thus L_2-L_1.

If L_2-L_1 is randomly conscripted, the net cost to individuals is the fraction $(L_2-L_1)/(L_3-L_1)$ of the area under the supply curve above the prevailing military wage. The triangle ACD represents this fraction. The triangle

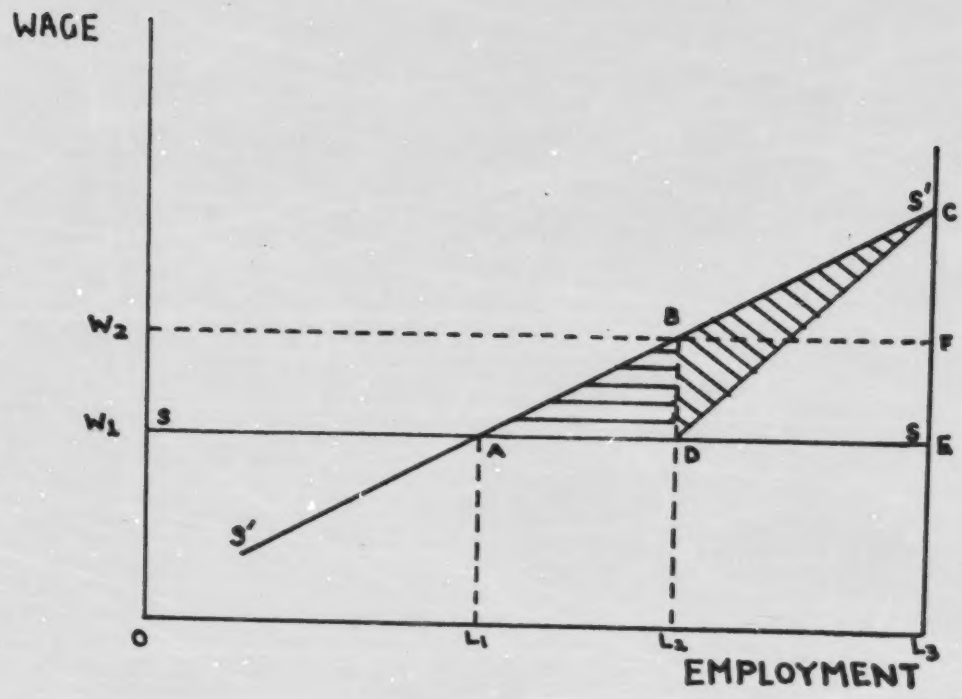

FIGURE 5.3. PREFERENCE ABROGATION WELFARE COST UNDER RANDOM CONSCRIPTION

ABD represents the minimum feasible cost of conscription- an amount that would prevail if minimum supply price identification and conscription were possible. A draft board system with provision for exemption from service where an individual can contribute more usefully to "the national interest" in civilian endeavors, has elements of such an identification process - but it ignores the disutility element and focuses only on a vague (social) productivity criterion.

The welfare loss involved in random conscription, then, is the utility cost in excess of that which would operate with minimum supply price provision of the required force strength. This is triangle BCD, which is represented by

$$W = 1/2\ (w_2-w_1)\ (L_3-L_2) \qquad (2)$$

i.e.
$$\frac{W}{(w_2-w_1)L_2} = \frac{L_3}{2L_2} - \frac{1}{2} \qquad (3)$$

The expression $W/(w_2-w_1)L_2$ is the welfare loss as a proportion of the gross tax subsidy value of conscription (the savings in budget outlay for a volunteer force of size L_2). Stated in this way, the welfare loss from lottery conscription is a function of relative manpower demand and can be given as:

L_2/L_3	.01	.25	.50	.75	1.00
W	49.50	1.50	.50	.17	.00

We see that the larger is military manpower demand relative to the eligible population, the smaller is the random conscription welfare loss in proportion to the gross tax subsidy. The latter increases more rapidly than does welfare loss, as relative requirements increase.

This model approximates fairly closely the Australian draft situation over the period 1964 to 1972. There was little evidence of draft induced enlistment, the best-fit supply curve was linear and conscription was by lottery ballot for which all males turning twenty were eligible. Deferments were available, but they did not become exemptions, so that randomness in induction was maintained.

The relative resource requirement over the period 1964 to 1972 was an average annual military strength of 45,000 17-24 year old males, which represented 13 percent of 17-24 year old males meeting military enlistment standards, i.e. $L_2/L_3 = .13$. Using equation (3), this figure implies an annual welfare loss 3.34 times the gross tax subsidy provided by the draft system then in operation. The tax subsidy can in turn be calculated, say, for the reference year 1970 as:

$$(w_2-w_1)L_2 = (4863 - 3354)45,680$$
$$= \$A\ 69\ \text{million}$$

where w_2 is the annual military income that would bring forth sufficient voluntary accessions to maintain a steady state force strength of 86,180, including 45,680 17-24 year olds. w_2 is calculated from the supply function using an income elasticity of 1.48 and replacing 16,000 conscripts.

The total annual welfare loss resulting from conscription's disregard for the individual preferences of conscripts was thus of the order of 3.34 x 69 = $A 230 million (1970) per annum for Australia.

A lottery draft is not the only form conscription can take, and welfare costs will vary with the system of conscription, as well as with manpower requirements, military pay and the form of the supply function. A simple alternative to a lottery draft would be for the government to issue draft notices to all eligible persons, but to sell exemptions at fixed price. Thus in Figure 5.3, if the government required a military labor supply of L_2 it could set the price of exemptions at w_2-w_1. Those with a supply price below w_2 would choose not to purchase an exemption and so would be inducted, or volunteer if their supply price is below w_1.

In addition, however, there would be individuals with reservation prices above w_2 who would not have the funds to buy their exemption. Only if the supply schedule represents the amount each individual is willing to pay to avoid military service, will the representation in Figure 4.3 be an equilibrium solution for the personnel requirement

L_2. Otherwise a rationing device, or lowering of the exemption price, will be required to obtain equilibrium.

In some respects it is possible to view the U.S. Selective Service system as a form of the exemption system. Certainly Selective Service did not operate in a completely random manner since, by bearing costs, it was possible for various groups to avoid the draft. These costs took the form of continuing in school, entering an exempt occupation, marrying and becoming a parent, emigrating to Canada, paying legal costs to fight induction, incurring disabilities, etc.

The analogy with a formal exemption system breaks down, in that that there was no single fixed cost which could be paid to avoid the draft. A more realistic model would incorporate the probability of being inducted as a declining function of the cost incurred to avoid the draft. However it is difficult to proceed too far in this direction since, as well as the problem of specifying empirically such a cost function and a supply function, the approach suffers from the problem that maximum willingness to pay cannot exceed, but may fall short of, supply prices given by the estimated supply function, due to non-constant marginal utility of income and also to capital market imperfections, which prevent the acquisition of funds with which to seek to purchase exemption. It might be thcught that to use instead the distribution of civilian earnings as the supply curve might solve the problem, but this only runs

into the difficulty that, while it would be an indication of ability to incur costs, it would not measure willingness to do so.

Of course, to continue to employ direct supply function estimates of the welfare loss for the U.S. with Selective Service, is to bias the cost estimate upwards, since the major component of non-random selection is the ability of the college-educated to avoid serving in the military in the same proportions as their non-college peers. Larry Sjaastad and Ronald Hansen have nevertheless tried to estimate this welfare loss, and allow for this bias, by assuming that, for college graduates, income and supply orderings are the same, and by setting up for college graduates a constrained function relating the probability of entering the military to position on the income scale.[9] The assumption of random selection was retained for persons of lower education than the college group, including reluctant volunteers. This estimation procedure implied a welfare cost, due to conscription's disregard for individual preferences, of $1,080 billion (1970), using a constant elasticity assumption of 1.25, (compatible with estimates derived above).

This estimate is the Sjaastad-Hansen estimate of the difference between the set of supply prices for draftees and reluctant volunteers and their military earnings, less an estimate for the equivalent loss for minimum supply price conscription.[10] Making this latter adjustment gives an

estimate of welfare cost due to conscription's disregard for individual preferences, insofar as it is in excess of the minimum loss compatible with the manpower requirement. In this way we measure here the pure allocative welfare loss. The welfare losses that would obtain for draftees under minimum supply price conscription (whose allocation equals that of a voluntary market solution) will be considered, along with economic rents foregone, under the discussion of distributive costs.

The adjusted Sjaastad-Hansen estimate is best considered a very broad order of magnitude calculation only, but the general point is evident: there are substantial welfare losses due to conscription's inability to adjust well to individual preferences. And whatever the accuracy of the estimates, this conclusion follows as a necessary matter of logic given certain basic assumptions. All that we need to recognise is that voluntarism is self-selecting, and that a volunteer force will attract those individuals with the lowest supply prices consistent with military requirements. On the other hand, any form of draft (other than minimum supply price conscription) will include many young men with remunerative civilian employment opportunities or with a strong distaste for military life. Entrance standards will ensure it does not include many with low civilian productivity, and those with a strong taste for military life will already have volunteered.[11]

Uncertainty and Avoidance

The final set of allocative costs that arise from the presence of conscription derive from the uncertainty of being drafted and from attempts to avoid or postpone being drafted.

Some of these costs as they related to employment difficulties for both employers and employees were noted earlier in this chapter and illustrated in Table 5.2. Similar uncertainty impacts upon education decisions can similarly be documented. In a 1970 survey of Australian university students, 11 percent of young men of ballot age said that they had deferred making important education decisions until their ballot result was known. Of those students not yet of ballot age, 15 percent indicated that they were deferring final career decisions until the ballot results were known.[12]

Avoidance effects arise from the incentives provided by the existence of the draft, and its particular rules of operation, to escape the burden of military service. Individuals make decisions they would not otherwise make in order to avoid being conscripted. The spectrum of opportunities will vary with the system and can range from becoming a theological student to deliberately inducing medical conditions, developing minor criminal records or fleeing the country. Even the offer of postponement of obligation to serve, as opposed to likely exemption, can produce

significant differences in patterns of choice. The whole problem of conscientious objection and non-compliance, of course, owes most of its existence to the conscription system.

An indication of the nature and extent of these effects can be given by looking a little more closely at two of them: student deferments and marriage exemptions. With student deferments, in Australia, while no exemptions were avilable, deferments were, so that there was still an incentive for some young men to postpone military service and to continue training when they otherwise would not; perhaps in the hope that conscription might be abandoned by an alternative government or its length reduced, because their training will ensure better military postings, or simply to put off something they find distasteful for as long as possible. The 1970 Australian student survey found that 14 percent of post-graduate students considered National Service a factor in their decision to undertake higher studies. It will be remembered that this applied at a time when only about 8 percent of those eligible for the draft actually served.

In the United States student deferment became important in the 1960's when growth in the size of the draft-eligible population permitted deferments to become effective exemptions, particularly if pyramided into dependency deferments. The outcome was a relatively low military

participation rate for college men; in 1964 70 percent of high school dropouts aged 27-34 had served in the military as opposed to 17 percent of non-medical college graduates with advanced degrees.[13] The concern is, of course, an important equity one, but there is also the allocational issue of interference with free market choice. Some might see such an incentive to continued education as a social gain. General Hershey felt that "a fellow should be compelled to become better and not let him use his own discretion whether he wants to get smarter."[14] The General may be right. But if he is, it means ignoring individual preferences as our criteria for welfare evaluations. Moreover, if there are felt to be deficiencies in the education system's ability to meet the nation's schooling needs, and this was not at all clear in the 1960's, the question should be asked whether adding one more imperfection to the market is a more efficient way of improving the education system, than tackling directly other market imperfections, such as finance market inadequacies for investment in human capital.

Some additional non-survey evidence on the draft's impact on education is given in Table 5.3. For the United States, male first-time college enrollments, as a proportion of 18-24 year old males, are related to trend, a student deferrment dummy variable, and variables for draft pressure and military casualty rates. It is found that the latter

TABLE 5.3. EDUCATION IMPACTS OF CONSCRIPTION: REGRESSION ANALYSIS

UNITED STATES, 1946-1973, annual				AUSTRALIA, 1964(1)-1974(1), quarterly		
Variable (mean value)	Coefficient (t-statistic)			Variable (mean value)	Coefficient (t-statistic)	
	Equation 1	Equation 2	Equation 3		Equation 1	Equation 2
Dependent Variable	EPR1	EPR1	EPR1	Dependent Variable	EPR2	EPR2
(0.062121)				(0.29453)		
Trend	0.00166	0.00161	0.00156	Trend	0.00156	0.00161
(14.5)	(6.573)	6.871)	(6.780)	(21.0)	(11.868)	(4.973)
Deferment Dummy	0.00649	0.00745	0.00689	Draft Dummy	0.0196	0.0218
(0.75)	(2.271)	(2.560)	(2.295)	(0.73171)	(5.5055)	(2.568)
Casualty Rate		-0.00030	-0.00015	March Quarter	-0.06253	
(2.39132)		(-1.184)	-0.479	(0.26829)	(-14.254)	
Induction Rate			-0.04788	June Quarter	-0.00546	
(0.019686)			(-0.815)	(0.2439)	(-1.2208)	
Constant	0.03024	0.03131		September Quarter	0.00533	
	(6.041)	(6.816)		(0.2439)	(1.1970)	
				Constant	0.26158	0.1993
					(51.96)	(20.767)
R^2	0.9261	0.9302	0.9322	R^2	0.9398	0.7966
Durbin-Watson	1.38	1.48	1.48	Durbin-Watson	*	*
N	28	28	28		41	11

EPR1 = first time enrollments in college, males 18-24/population, males 18-24.
EPR2 = total school enrollments, all males/all males not in labor force.
*No Durbin-Watson statistic given by search program.
All equations are adjusted for serial correlation.
Data sources: See Appendix.

two variables do not contribute significantly to explanation, but that the student deferment dummy variable is quite significant and that it implies a 12-14 percent increase in new college enrollments over trend, 1948-1973.

For Australia, the best available data was for quarterly male enrollments in school as a proportion of males not in the labor force. This dependent variable was related to trend, seasonal dummy variables, and a draft dummy variable for the period 1966 to 1974. The draft variable represents student deferment because such a deferment option was available for the whole period of the operation of a draft. The conscription dummy variable was found to be highly significant and implies an average increase in number of enrollments of 7-1/2 percent above trend. A regression on first quarter (new school year) observations alone did not alter the estimate substantially--an estimated absolute enrollment impact of 8.0 percent instead of 7.6 percent.

Similar results are reported in Table 5.4, for the impact of conscription upon the marriage rate. In Australia, married men were exempt from call-up during the whole period of National Service, 1964-1972. The regression of the annual marriage rate for young men 17-20 years of age on trend and the annual induction rate indicates a significant impact for conscription. In absolute terms,

TABLE 5.4. MARRIAGE IMPACTS OF CONSCRIPTION: REGRESSION ANALYSIS

UNITED STATES, 1962(1)-1966(4) quarterly			AUSTRALIA, 1962-1973, annual		
Variable (mean value)	Coefficient (t-statistic)		Variable (mean value)	Coefficient (t-statistic)	
	Equation 1	Equation 2		Equation 1	Equation 2
Dependent Variable	MR1	MR1	Dependent Variable	MR2	MR2
(0.02495)			(3.6517)		
Trend	0.00001	-0.00008	Trend	0.09371	0.09757
(10.5)	(0.299)	(-1.172)	(6.5)	(2.096)	(2.151)
Marriage Dummy	0.00168	0.00216	Induction Rate	9.298	4.243
(0.45)	(3.925)	(4.282)	(0.04925)	(2.185)	(0.6025)
Induction Rate		0.2216	Vietnam Dummy		0.4389
(0.004572)		(1.596)	(0.5)		(0.9060)
March Quarter	-0.00449	-0.00447	Constant	2.585	2.589
(0.25)	(-7.44)	(-7.801)		(8.304)	(8.233)
June Quarter	-0.00482	0.00502			
(0.25)	(8.064)	(8.64)			
September Quarter	0.00582	0.0059			
(0.25)	(9.695)	(10.31)			
Constant	0.02253	0.02215			
	(35.96)	(34.55)			
R^2	0.9677	0.9730	R^2	0.6370	0.6707
Durbin-Watson	1.70	1.94	Durbin-Watson	1.50	1.73
N	20	20	N	12	12

MR1 = grooms 18-24/population of males 18-24
MR2 = grooms under 21/population of males 17-20
Data Sources: See Appendix

the average annual draft intake of 8,400 was associated with an average annual increase above trend of 1,800 marriages with grooms under 21. This may not measure a pure draft effect though since conscription involved a high probability of combat duty in Vietnam. Multicollinearity prevents effective estimation of the separate effect, so the result is best interpreted as the marriage impact of conscription involving combat duty.

In the United States, fathers did receive effective exemption under Selective Service but married men without children were generally inducted. The exception to this was the period 1963(3) to 1965(2), when President Kennedy placed married men in a lower order of call than single men. A quarterly regression of the marriage rate for 18-24 year old men, using as independent variables trend, seasonal dummy variables and a dummy variable for Kennedy period of marriage deferments, found the marriage dummy variable quite significant and gave an estimate of an 8.6 percent increase in the marriage rate. Inclusion of a separate draft pressure variable altered this estimated impact slightly to 6.7 percent. This latter lower estimate represents 65,000 marriages per annum above trend over the period.[15] Annual inductions averaged 120,000 in that period.

More elaborate statistical investigations, perhaps motivated by appropriate theory (e.g., Becker on marriage,[16])

would improve the estimation of these effects. The use of trend, especially, is a very blunt instrument. There may be important independent variables whose influence varies significantly from the pattern implied by a trend variable. Thus, in education, for instance, we would like to include the respective returns and costs to different levels of education. However, such data is not easy to obtain. It is simply not available for Australia, where income data with an education classification has only been available since 1972. And in the United States, appropriate series are also difficult to obtain over the data period (1946-1973) of our analysis. Accordingly, the exact level of impact may be different from that estimated here. However, the general point seems clear: conscription provides incentives for many individuals to alter personal planning.

The costs to individuals of these altered choices is also evident in general terms--both personally for the individual concerned and from the economists' allocative viewpoint, where it is recognized that real resource costs are involved. The activities entered into by people to avoid induction are real costs to society and may even involve further externalities as with, say, the impact of young and precipitate or reluctant marriages on the children of those unions.

To put a dollar value on these costs is not easy, even for an economist. One indirect method would be to develop

the model discussed in the previous section, which incorporates a function for the cost of avoiding the draft. Sjaasted and Hansen did do this in their estimation of real costs of the draft for the President's Commission on an All-Volunteer Armed Force.[17] In terms of Figure 5.3., the estimation is of the area BDEF, if w_2-w_1 is interpreted as the amount spent in avoiding the draft. Under a variety of assumptions concerning the functional form of the supply function and parameters of that function, Sjaasted and Hansen found a quite tight cluster of estimates of total uncertainty and avoidance costs, $3.0 billion (1970) for a pre-Vietnam size force as of 1964.

Apart from further questions as to the empirical size and form of the induction-probability cost function, for which no sensitivity analysis is offered, this estimate must be treated carefully because the supply function employed is one measuring supply price, when the concept required is that of willingness to pay. This means the Sjaasted-Hansen estimate is an upper bound. However, even if the cost were only half of that estimated, the uncertainty and avoidance costs of the draft would still impose an important loss on society, and that is in addition to the other allocative losses already discussed.

Conscription, then, through its inefficiencies and distortions, imposes a wide range of extra costs on society. Many of these costs are hidden and do not appear in government

budgets, but they are nevertheless real, and while they are difficult to estimate, they would seem to be significant. The preference abrogation costs alone would seem to exceed the extra budget cost of adopting all-volunteer forces in peacetime, and the higher are those budget costs anyway, the higher real costs to society must be. Young men by their supply price position and avoidance actions reveal how highly they value their freedom of occupational choice, and thereby reveal, equally, how much of a welfare loss is imposed under a draft. Voluntary or free market recruitment does not impose these costs and so represents a saving, not a cost, to society, in these allocation terms. Indeed, the more a claim is made that an all-volunteer force is "too expensive" in peacetime, the more it is implied that the economic welfare costs of using a draft are large.

DISTRIBUTIVE EFFECTS

To discuss the distributive effects of conscription we recognize that conscription is a tax and we examine the magnitude and incidence of that tax. In examining this area we can only seek to outline the actual distributional implications of alternative procurement systems, and demonstrate how those distributional outcomes fare under various equity criteria. The major alternative criteria raised in discussion of military recruitment are introduced, but the choice between them is an individual value judgment.

Conscription as a Tax

Conscription is an implicit tax-in-kind levied by the state and paid as insufficiently compensated labor for servicemen, both conscript and volunteer. By the use of compulsion, the state acquires the labor services of a number of individuals, under terms unfavorable to those individuals. For the draftee and draft-motivated volunteer, the tax is the amount over and above the military salary received, that would have been necessary to induce free enlistment by the same individuals in the absence of the draft. For the true volunteer, the tax is the amount by which current military pay is lower than it would be if the force were recruited on an all-volunteer basis.

In principle, these comparisons will include the effect of military service on subsequent earnings, and,

in this context, it is often asserted that "the military trains individuals who may transfer their training and job experience and economic perceptions to their civilian life, thereby enriching themselves, the economy and society."[18] But there is little evidence to support this view. Military training and re-establishment benefits merely replace civilian formal and on-the-job training and job market position that would otherwise be obtained, and the net outcome seems to be that there is little difference in future earnings between veterans and non-veterans of otherwise comparable background,[19] once the initial "frictional" readjustment problems discussed earlier are overcome. For this reason we focus solely on income comparisons for the period of active military service. Interestingly enough, there is also substantial survey evidence that military service experience has little or no effect on a veteran's attitudes and opinions as well as income,[20] an important finding for those who would seek to justify conscription on "military service is good for you" grounds.

Under the definition adopted, the conscription tax may be seen as being composed of three parts. One part is the foregone economic rent for true volunteers. These personnel would have enlisted anyway, but under an all-volunteer system they would have received higher pay. The true volunteers are for this reason taxed by the conscription system

since they are denied the extra income they would have received if recruitment were on the same free basis as other occupations.

It might be thought that inclusion of rents renders the tax concept too broad, since rents, by their nature, involve no allocational change or loss and since true volunteers are not compelled to enter the military. Some writers such as Parrish and Weisser,[21] have restricted their definition of the conscription tax so as to exclude rents foregone. Logically, however, refusal to treat rents foregone as a tax should require rents actually collected by other sellers of goods and services to the government to be treated as subsidies. The norm, under a voluntary system, is that "surpluses, be they generated in production or consumption, are properly the property of the person to whom they normally accrue."[22] Since conscription is a coercion in an otherwise voluntary labor market system, it seems reasonable to accept the norm and to treat rent foregone as a tax, particularly since rents are retained by other sellers of goods and services to the government.

The remaining two components of the conscription tax apply to draft-affected individuals: draftees and draft-induced volunteers. For these individuals the tax comprises opportunity cost and disutility cost. The former is the financial measure of the difference between military income

and foregone civilian income. This is likely to be negative since military enlistment standards reject for service most of those who would have low civilian productivity. The disutility cost is the additional amount over civilian income that would have been necessary to compensate for aversion to military service and so induce truly voluntary enlistment. The amount could be negative if an individual preferred military to civilian life, but in this case he is unlikely to be a draftee unless his civilian opportunity cost is quite high. The disutility cost will be less for a draft-induced volunteer than for a draftee.

An example may clarify the nature of the implicit conscription tax and its components. Let us take the case of a conscript whose annual military income is $3000, but who could have earned $3800 pursuing his normal civilian occupation as a school-teacher. The opportunity cost foregone here is $800. If it would require $4500 to induce this same chap to volunteer for military service quite freely, then the disutility cost is $700, and the total implicit tax for this draftee is $800 + $700 = $1500, or 40 percent of his alternative civilian income (50 percent of his military income). The draftee pays no foregone rent. This applies to the true volunteer. If the military could achieve all its manpower requirements on a volunteer basis by raising military income to $4000, then the foregone rent or implicit

tax on the true volunteer is $1000 or 30 percent of actual military income.

It is evident that this concept of an implicit conscription tax is closely related to the welfare loss associated with preference abrogation discussed under allocative effects of the draft. Indeed that welfare loss is one part of the total conscription tax, but we broaden the concern here to not only include the difference between reservation prices under a draft and minimum feasible reservation prices, but also the difference between minimum supply (reservation) prices and actual military income, as well as foregone economic rents. The latter two elements do not reflect any allocative loss but they do represent foregone income under coercion and so should constitute part of a tax measure.

The position is readily appreciated by returning to Figure 5.3. To the welfare loss of area BCD we now add area ABD to give the total difference between supply price and military income for draftees under randon conscription. Finally, adding area AHAB gives economic rent foregone as well.

It will be recognized that ABD + AHAB together form what was referred to earlier as the gross tax subsidy value of conscription--the savings in budget outlay for a volunteer force of the same size. The net tax subsidy would allow for cost savings due to the greater "non-effective"

force component under conscription, an amount that is accounted for separately as part of allocative losses. Since we know both gross tax subsidy value and welfare loss due to preference abrogation for the Australian case in representative year 1970, it is an easy matter to the total annual conscription tax for Australia at: 69 + 230 = $A 299 million (1970), or 10 times the budget cost of ending the draft in 1970, as estimated in Chapter 3.

The equivalent estimate for the United States, is that by Sjaasted and Hansen for the Gates Commission, made on the basis of the assumptions outlined above. The estimate was a total conscription tax of the order of $3.4 billion (1970) annually for the period prior to Vietnam, adapted to reflect changes in civilian and military compensation through 1969. Of this, rent foregone constituted $1.3 billion. Comparison of the supply function estimate of the remainder of the tax, ($2.1 billion), with a direct cross-section estimate of the financial burden of conscription, in terms of foregone alternative civilian income, indicated that opportunity cost was $1.6 billion of the tax and disutility cost was therefore, by implication, $0.7 billion. These estimates are undoubtedly the best available.[24]

Equity in Taxation

The fact that conscription imposes a tax, even one of such magnitude, is not in itself a distributive concern

What makes the tax important for distribution is its incidence. And conscription is a highly discriminatory tax. In Australia over the period of National Service, 1964-1972, only 8 percent of males of eligible age were required to serve in the military as draftees. That 8 percent paid an average tax rate, including regular income taxation, of 81 percent. Civilians not drafted, and earning the same money income, would have paid only an 18 percent tax rate. The implicit tax for volunteer servicemen meant that they paid an average tax on military income of 38 %. Civilians paid only 24 % on that same money income.[25]

In the United States over the period of operation of Selective Service, 1948-1972, on average, only 18 percent of males in a draft eligible year group were inducted, and this includes inductions for Korea and Vietnam. For the period immediately prior to Vietnam, the Sjaasted-Hansen (Gates Commission) estimates of [illegible]icit tax indicate a total tax burden of 51 percent of taxable income for draftees and draft-induced volunteers. In 1967 the average personal tax paid by all persons whose gross earnings were equal to the amount that would have been earned by draftees and draft-induced volunteers as civilians, was less than 10 percent of that gross income.[26]

The extent of discrimination in taxation, between those who serve and those who do not, will of course vary

with the military salary paid, civilian alternative incomes and relative military tastes and the proportion of the population obliged to serve. But it will remain true in general that the conscript and military volunteer will not only be required to defend their fellow citizens, but also to pay a relatively higher tax than those civilians for that privilege. A small number of individuals will be obliged to bear a highly disproportionate share of the defense burden, and servicemen, under conscription, will subsidize the general taxpayer.

It might be thought that this is beside the point if each person has an equal chance of service. Pauly and Willett have referred to this concept as ex ante equity: where each individual has an equal probability of incurring the obligation of paying a tax.[27] Such a situation will rarely obtain in practice. The likelihood of hostilities, for instance, will vary over time so altering the likelihood of combat service and producing an associated inter-generation inequity. Moreover, within a generation, there will be differences of sacrifice. Even a random lottery system, for instance, still tends to produce discrimination in the imposition of taxation for defense.

To see this latter point consider the Australian National Service System. Certainly compared to the U.S. Selective Service System, with the latter's "patchwork quilt"

of exemptions and deferments and their arbitrary administration by local draft boards, the Australian ballot more closely approximated ex ante equity in the distribution of the defense tax burden. The Australian system was much more straightforward and uniformly administered and involved less uncertainty, than the U.S. Selective Service arrangements. Nevertheless it was still a long way from ex ante equity. Women, aboriginals, expatriates in an overseas territory and diplomatic personnel were not even required to register. Religious personnel, conscientious objectors, and married men and military reserves were exempt or indefinitely deferred. Restricted deferment was available to students, apprentices and hardship cases, and those not meeting military standards were rejected. The process of equal chance of service was thus considerably qualified on a non-random basis, and at the same time the ex post or after-the-fact situation was still one of extreme inequity. A very small minority of young people were forced to serve while others were not, and those others suffered no other compensatory burden.

Various details of the system could well be improved: conscientious objection arrangements altered, deferments eliminated, and so forth. But as one Richard M. Nixon once emphasized: "Some say we should tinker with the present system, patching up an inequity here and there. . . . But in the long run, the only way to stop the inequities is

to stop using the system. It does not work fairly--and given the facts of life, it just can't. The inequity stems from one simple fact--that some of our young people are forced to spend two years of their lives in our nation's defense, while others are not. It's not so much the way they're selected that's wrong, as it is the fact of selection."[28]

Even if problems of rejection and exemption, of variance in the demand for servicemen, and of discrimination on the basis of sex could be overcome, such an "ideal" lottery would only equalize the risk of being drafted. After the fact, all young people would not bear equal shares of the burden of defense. This concern then is one for the achievement of ex post equity. Universal conscription would more closely meet this requirement. But some exclusion would still be used. Only young men would probably be registered, and unqualified young men would not be inducted. If service was to be of any efficient length, exemptions would also be necessary in many occupations. Moreover the induction of all qualified young men, in excess of military need, is an extreme action in the pursuit of equity. There are alternatives.

One would be a compensatory tax on those who do not serve. In Switzerland all males unable to meet military acceptance standards, or those abroad, pay until age 35

special property and income taxes. Otherwise all Swiss males have military assignments. A modified proposal for the situation where relative military manpower requirements are smaller, has been advanced by Greene and Newlon.[29] They suggest that 18-year-olds register for military service and be presented with three options: (1) an enlistment bonus; (2) a draft exemption upon payment; (3) a lottery draft for those not selecting the first two options. The enlistment bonus would be paid for by the tax surcharge on the income of those choosing exemption. The willingness to pay for exemption would determine the size of the enlistment bonus and hence, in turn, the probability of being drafted for those choosing the third option.

The Greene-Newlon proposal meets the concern of many that, while draftees serve, life remains "business as usual" for others. Under this scheme exemptees also pay a penalty, and one which is progressive in terms of a surcharge incorporated into the regular income tax structure. The scheme, though, is very similar to the system, employed in the U.S. by the North during the Civil War, of selling exemptions to the highest bidder and permitting the practice of hiring substitutes. It has generally been held subsequently that this Civil War-type scheme is morally repugnant--though as we have seen above, the U.S. Selective Service scheme after World War II operated in a similar manner, insofar as

individuals could avoid service through payment of avoidance costs. Ironically each of these "exemption payment" systems is more progressive than the lottery system, in terms of tax burden.[30] Both exemption and lottery system, though, remain generally regressive, as well as discriminatory, since the tax still falls to a large extent on individuals whose income is relatively low because of their youth.

A final possibility that meets many of these objectives is to extend the Greene-Newlon logic and consider direct compensation of those who serve. Professor Eli Ginzberg has suggested that "fringe benefits" should be added to a lottery system as compensation, in order "to make the incidence of luck less brutal."[31] But why stop at partial compensation? Why not compensate those who serve from general revenue (taxation and debt) at a rate which leaves them as well off as if they had not been drafted, that is compensate them fully for being drafted.

But no conscription is necessary with full compensation, it being just enough to induce voluntary enlistment in the military. It is what the individual requires to join the military. And this is exactly what all-volunteer recruitment does. It compensates individuals enough to enlist, and it does so more efficiently than fully compensated conscription since it obtains those individuals who are most willing to enlist. Ex ante and ex post equity are achieved

in that everyone has an equal (zero) chance of being conscripted and no one actually is selected to serve under coercion.

In terms of distributive effects, peacetime conscription does not invoke the principle of equal sacrifice in defense of the nation. Rather it imposes a quite unique burden upon a distinct minority. That minority pays a tax that is discriminatory, regressive, and is paid in kind through voluntary labor service. A fully voluntary system supported by explicit money taxes or debt issue, would ensure that all who benefit from the provision of the public good, defense, bear the tax burden of that defense in accordance with the standards of distributional equity embodied in the country's general taxation structure. Rather than requiring a few men to make a major sacrifice while earning the tax burden for others, a volunteer system spreads that sacrifice without such discrimination and regression, and servicemen themselves receive an income that is, in their own evaluation, sufficient to compensate for the burden of actual service that they bear.

Equity in Condition

There is another dimension of distributional equity that has been raised in connection with the burden of military service, and this is the criterion of "equity in taxation" as opposed to the principle of "equity in taxation" which we have been discussing. Equity in condition,

or group equity, requires like treatment of social groupings. It is this concept of distributive equity which implicitly underlies the moral objections to an "exemption-payment" draft system and many people seem to feel that the same objection should apply to a volunteer system since that will lead to resting the burden of defense upon the poor who are attracted by volunteer military incomes. Whatever the merits of this argument for an "exemption-payment" or "substitute" draft, for a volunteer military this vision of young men being bribed from the ranks of the unemployed to serve as the nation's cannon fodder bears little relation to reality. The armed forces are already largely volunteer, the really disadvantaged simply fail to meet military entrance standards and the officer corps is clearly drawn from quite advantaged backgrounds. Moreover the higher military salaries of a volunteer force open up the broad range of middle incomes for potential enlistment and so make the military more attractive to the privileged segments of society, not less, as is confirmed by British and Canadian experience.[32]

Much of the concern for promoting group equity in military service probably derives from the belief that military service is a special case of high risk of death in defense of the nation. But the individual volunteering for a professional career in peacetime, simply does not unduly

increase his risk since the peacetime incidence of death and injury is naturally low, most men are able to serve in non-combat areas and the risk is mainly in being assigned to combat leadership in wartime. For limited war of the Vietnam type the death rate for servicemen is less than the death rate at home, combat casualties being offset by much lower motor-vehicle casualties among active servicemen.[33] For a larger war effort a draft would be used anyway and it is those inducted into the infantry for the duration who then bear the real burden, not career military personnel. At least for peacetime and limited war military service, concern for the disadvantaged would be better directed at remedying the sources of that disadvantage in civilian life.

The intent here though is not to impose ethical criteria but rather to outline those equity effects revealed by economic analysis. That outline can then serve as an input, along with other information, in the application of principles of social justice to this case of choice of institutions for military recruitment.[34]

FLEXIBILITY IN RAISING MANPOWER

An important argument advanced for a draft even in peacetime is that conscription may be superior to all-volunteer recruitment in flexibility. One element of this superiority would be that under conscription military needs can be met simply by a change in draft calls. In Australia and the United States this is a matter of administrative regulation, since the legislature does not have to approve changes in the size of the draft intake.

With volunteer adjustment there may be considerable lags in responding to changes in volunteer incentives, and there can be uncertainty as to the exact level of that response. Some evidence on the length of lag is obtainable from the dynamic equations given in Chapter 4, though the assumption of a uniform lag for all independent variables is restrictive. The empirical results are given in Table 5. It is seen that for Australia over 90% of adjustment is estimated to take place in the first quarter. For Britain and the United States in several instances there is an adjustment greater than 100% in the first quarter, implying a reduction in supply response in subsequent quarters. The longest lag estimated is for the United States army model with relative pay, where adjustment is largely complete by the third quarter.

In general, the adjustment lag with voluntary recruitment seems not to be too long. The major difficulty with volunteer enrollment, though, is probably not the adjustment

lag, but rather the uncertainty as to the exact level of response. As our estimation in Chapter 4 showed, even in analyzing the impact of policy variables over past periods, the variance in estimation can be quite large. The problem is, of course, compounded for forecasting. Responses therefore cannot be predicted exactly, and in emergency situations this could be a severe limitation to dealing with the crisis.

TABLE 5.

ADJUSTMENT LAGS IN ENLISTMENT SUPPLY

	AUSTRALIA		BRITAIN		UNITED STATES	
	β	$(1-\beta)$	β	$(1-\beta)$	β	$(1-\beta)$
Relative Pay Model:						
Army	0.0466	0.9534	-0.1654	1.1654	0.5700	0.4300
Defense	0.0709	0.9291	0.2805	0.7195	-0.1128	1.1128
Absolute Pay Model:						
Army	0.0084	0.9916	-0.1735	1.1735	0.3461	0.6539
Defense	0.0751	0.9249	0.2055	0.7945	-0.1097	1.1097

β = estimated coefficient of the lagged dependent variable

$(1-\beta)$ = implied lag coefficient (the percentage of adjustment in the first quarter).

The disadvantages of voluntarism as regards this uncertainty could be moderated through various devices. One device could be the use of enlistment bonuses for recruits in time of crucial military manpower shortage. Costs would be reduced by this because it would be recognized that the bonus

would not be permanent, and that it would apply to recruits only. Provided crises requiring build-up of new enlistees were rare, as we would assume, no expectations affecting potential recruit timing of enlistment would be created - except at the time needed. A general (emergency) pay increase would increase budget cost more than an enlistment bonus.

Another alternative would be to improve conditions of service sufficiently during peacetime so that an excess supply of volunteers obtains. Quotas could then be administered on a first-come basis, or standards could be raised. In an emergency the arbitrary quotas would be removed, or standards lowered. This is a case of paying more than the market-clearing wage in order to provide extra advance flexibility. It is, therefore, improved flexibility, but at extra cost, which must be attributed to an all-volunteer force.

There is still some remaining uncertainty with these schemes. Response to an enlistment bonus is difficult to predict, and what is an excess supply in peacetime may not be so in war, with a shift in tastes. Of course, the more that the validity and importance of an emergency military commitment is accepted by the community, the fewer difficulties will be experienced in recruitment.

But the pros and cons on this issue are perhaps really beside the point. New accessions, whether volunteer or conscript, must be trained, organized and equipped before they

can be used. This is a process requiring a current minimum of six months for recruit training plus some specialist corps training. Further training is needed in most specialist fields for adequate performance. In the United States, law requires that soldiers not be sent overseas until they have at least six months' training. In Australia conscripts were not sent to Vietnam until nine to twelve months' training had been completed.

Clearly, what is required for immediate emergency needs is not new untrained accessions, but trained reserves to supplement the standing force capacity. Perhaps again it is conscription which provides most adequately for this need too, since under conscription the number of experienced former servicemen is greater than for a volunteer force, due to higher turnover. As Prime Minister Gorton of Australia put it: "Sure we have to pay the people who train them and sure National Servicemen are there for only eighteen months, but (it is also true) immediately an emergency arises, we have an army of twice the size than otherwise we would have had."[35]

One offset to this is that there is still turnover from an all-volunteer force, and former volunteers have an undoubted experience and training edge over former conscripts, thus somewhat compensating for their fewer numbers. Moreover, this core of ex-regular soldiers could be supplemented by an expanded citizen-force component of non-prior service

reserves. Such reserves would indeed establish a continuing capability of experience and readiness, whereas the experience of the former conscript tends to be lost after a few years. As Darcy McGuarr has pointed out, a conscript trained in 1972 is of little advantage over a new recruit in 1980. In the peacetime context the resources expended in the training of conscripts because of their reserve advantages, would have been better spent on longer-term training of citizen-force specialists and leaders, and on such assets as ships, aircraft, dockyards and airfields which have much longer pay-off. "So far as continental defense is concerned, conscription is consumption rather than investment and, at a time of low threat, consumption rather than investment is a waste."[36]

This assumes that conscription is for the permanent forces. There is the alternative question of conscription for the reserve. For the peacetime situation it can be argued that a conscripted reserve is consistent with a volunteer regular force, and indeed may be preferred to a volunteer regular force, and indeed may be preferred to a volunteer reserve. The argument is an application of the criteria discussed for the standing force, adapted for the case of reserves. Strictly, neither system is dominant. From the viewpoint of individual preferences, individual equity and minimizing economic impact during call-ups, a truly volunteer reserve is preferable. The arguments against such a reserve are budget costs and social participation (equity in condition).

The budget cost consideration is probably not great for part-time service. The prevalence of "moonlighting" in the economy, for instance, indicates the wide interest in secondary employment opportunities. Moreover, the real economic costs will already operate irrespective of the budget cost. Adequate economic analysis of this is impossible, due to inadequate data available for reserve forces in Australia and the United States during the period of draft-induced enlistment in the reserves. The more important argument is that reserve voluntarism will reproduce the pattern of social participation in the military that is already found in the volunteer active forces. If there is concern over social representation in the permanent forces, universal or lottery-selective conscription would have much higher economic and budgetary costs, but would ensure ex-post equity, which lottery conscription does not. Lottery conscription's violation of ex-post equity could be ameliorated by guaranteeing civilian-comparable hourly wages; and preference abrogation costs will be smaller for part-time military service than for conscription to the regular military. To the extent there is some validity to concern over a volunteer regular military leading to professionalism and mercenarism, conscript reserves would serve as a counter-vailing pressure.

The choice between the two broad alternatives of voluntarism and conscription for reserve procurement, represents a trade-off between individualistic and collective

values. This, of course, was in part the case for procurement for the permanent force. The difference for part-time service is that a decision has been made on active duty procurement, and that the balance of net advantages may change for part-time compared to full-time service. The decision as to active-duty forces is relevant in that if a volunteer system is chosen, it may be felt desirable to offset the individualistic values of the former with the collective values of the latter. This would represent a compromise in the pursuit of social objectives, rather than insistence upon a preeminent value. The change in the balance of advantages is relevant, since a part-time obligation is less of an interference with personal behavior and way of life.

Whichever procurement system is decided upon for reserve forces, the point is that it is reserves who are most relevant for emergency needs. The question of induction flexibility really only arises in consideration of meeting manpower requirements for continuing hostilities and large scale mobilization. Here the advantages of conscription for regular active duty become more apparent. For actual hostilities, volunteer recruitment is uncertain, inefficient and inequitable. There is no ability to rely upon the correct number of volunteers forthcoming at the time required, there is a need to decide administratively which civilians serve a defense effort better in their normal occupations, and we may be concerned that no social group bears a disproportionate

burden in actual time of war. The burden of actually serving and in supporting the war effort through higher taxes will be more widely distributed under mobilization.

For the possibility of more than "brushfire" war (which can be met by the standing forces and reserves) it is reasonable to maintain a stand-by draft will full registration and classification procedures established.

ISSUES OF SOCIAL CONTROL

We have discussed in detail the evaluation of alternative military manpower procurement with criteria to which economic analysis was able to make certain contributions. But there are other important criteria about which economics can say little, and yet which may carry just as much weight as the factors already considered.

For completeness it is useful to briefly review the major remaining issues that are raised in considering the adoption of alternative procurement systems for a peacetime standing force. It will be seen that some parts of our earlier analysis do carry over and contribute to understanding of these further issues, but not as comprehensively as before.

Individual Liberty

Where the criterion is individual liberty it is clear that it is conscription that serves us badly. Conscription is a most drastic interference with the ability of an individual to order his life as he sees fit.

Of course if restriction of individual liberty is required to strengthen or preserve the overall system of liberty, the community's claim takes precedence and individual liberty must give way. The government does have a right to maintain public order and security. This is an "enabling right" which the state must possess in a democracy

if it is to fulfill its function of impartially supporting the conditions under which everyone can be free. Individuals can be seen as having a natural duty, subject to conscience, to support and comply with demands deriving from serious challenges to national security.

The essential point, however, is that these rights accorded the state in the name of national security are not given carte blanche. They can only be legitimately invoked when the security of the people is genuinely felt to be threatened and when it is therefore likely that not limiting liberty will lead to an even greater injustice, the complete loss of liberty.

Since our study is specificially concerned with the recruitment of a professional peacetime military, it follows that if considerable weight is accorded the importance of individual liberty there will be a strong presumption, on this ground in favor of voluntarism and against conscription. Where substantive potential threat to the nation's security is defined, the weight accorded individual liberty may well be reduced if its abrogation is shown on other grounds (e.g. flexibility) to be essential to the preservation of the general liberty. But this situation of clear and present danger to the nation is not the strategic situation posited for our analysis, and, as the discussion of flexibility indicated, a draft system is not the only means of effective preparation in peacetime for the uncertainties of the future.

A Mercenary or Isolated Army?

In comparing the performance of both conscription and voluntarism, the all-volunteer force is seen by some as inherently a mercenary military and therefore an ignoble and unreliable one. The problem is said to be the placing of a monetary value on service to country and on the lives of its citizens, and the raising of a force only by financial incentive. The first of these concerns can be readily dealt with. Soldiers will have to be paid and a financial value will thereby have to be attached to their service. This cannot be avoided any more than we can avoid a doctor charging a fee for saving a life. We are grateful to the doctor and we reward him well. To try and say that we should not reward a soldier, and that he should instead receive only a low wage so as not to demean himself is intolerable nonsense. The soldier no less than anyone else deserves to be paid a fair and adequate wage, in times when every citizen is not sacrificing all for a war effort.

More complex is the concern expressed that in a volunteer force men will be motivated not by the concept of service, but by the lure of greater gain. This is felt in itself distasteful, and is also believed inimical to reliable service. That the volunteer soldier so motivated will not give all in his country's defence is the apparent conclusion and one which leads people such as General Hershey to feel that

'personally I don't want to be defended by individuals who are there for no other reason than the money'.[37]

Such a view is a gross, albeit unintended, insult to all those who have volunteered and will volunteer for military service. Are the volunteers presently serving in the forces unreliable money-hungry mercenaries? Will the improvements in pay and conditions of service associated with an all volunteer army suddenly convert that force into an unprincipled band of mercenaries? The term 'mercenary' is a highly emotive one. Milton Friedman has pointed out that to proponents of free enlistment it is a volunteer army, to regular soldiers it is a professional army, to potential recruits it is a career army and to opponents of the idea it is a mercenary army.[38]

'Mercenary' carries strong implications of disloyalty, and literally means willingness to work for money as one's only major motivation. There may well be some men who place great weight on the money offered in the services. But even for these men that will not be their sole motivation, and for most a complex variety of factors will apply. In this, volunteers for military service will be no different from men entering any other occupation. As our model of occupational choice indicated there will be a wide range of factors entering the choice decision and while income will be one, it is by no means the only factor, and the weight accorded it will vary across individuals.

Besides, the basis of a volunteer approach is that servicemen be paid under the same principle as everyone else in society, i.e. they should be paid their hire. To pay less than the amount at which sufficient numbers would serve is actually to tax attachment to service and patriotism.

There is no reason to assume that a man's sense of duty will be weakened or his morale undermined by having his services appreciated with an appropriate wage; to suggest that men will enlist "only for pay" is to imply that all other factors influencing a decision to serve in the military suddenly vanish with a pay rise.

Since our discussion refers to the peacetime career military it is appropriate to draw an analogy with other occupations. There are numerous occupations in addition to soldiering which are in the national interest but for these too market wages are paid. For instance, it is for the community's protection that there is a court system and that judges are appointed. Yet we do not conscript lawyers to become judges so that those judges will not be mercenary. On the contrary we pay market wages, and the administration of justice is no worse for that.

A second objection to the volunteer force in terms of preserving the well-ordered society is the belief that a professional army would be isolated from civilian influence, with the possible result of a divergence of its purpose from that of the civilian government. This could lead to undue

pressure on the civilian government, and even, ultimately, direct military intervention in political life. In a sense this is a sophisticated version of the mercenary argument, though here the emphasis is on 'professionalism' and the development of a rigid military ethos in isolation from civilian influence.

But one should not place great weight on the role of the recruiting method in preventing military interventions since there are good a priori reasons why it should do little to influence the attitudes of the military establishment. It is the officer corps which defines military attitudes and determines military actions. And the officer corps will necessarily remain a volunteer one irrespective of whether or not there are conscripts in the force. Conscripts come in only at the lowest levels of military ranking, and since the task of army training is to militarise civilians and since the stress of that training is on discipline, obedience, and subordination, there is little opportunity for young impressionable conscript youths to civilianise the military.

The presence or absence of conscripts will play little part in altering the political loyalties and degree of influence of the military. If the attitude of the military is, in fact, considered a serious problem, other policy changes such as greater lateral entry to the forces, removal of fixed terms of engagement, and the greater use of civilian institutions for education and training of military personnel, would do

much more. A general model of what might be achieved is provided by the West German armed forces. American fears of a revival of German militarism led to the establishment of a military consitution which is more conducive to civilian control than almost any other in the world. But ultimately it is the broad governmental and cultural features of a society which are the real determining factors.

This is a conclusion well-supported by the available historical experience. In the countries we are examining in this study there have been no real military challenges to civilian leadership in modern times. The brief confrontations of General MacArthur with President Truman in the United States and General Blamey with Prime Minister Chifley in Australia were quickly resolved in favor of strong civilian leadership, and in both cases it may be noted that the generals were commanding mixed (with-draft) forces.

This latter point though should not be taken to imply that conscript forces are actually more amenable to supporting military challenges to leadership. European and Latin American experience with military intervention in politics does not show any discernible relation with the procurement system. Wilson and Horack have documented for Latin America the point that over the period 1945 to 1968 while there were 39 successful military coups or revolts in the 11 conscripting states, a third of these were accounted for by two countries

only, and that the 7 states relying upon voluntary service also experienced 11 successful military coups or revolts.[39] Factors other than the procurement system would seem more important in determining the viability of civilian government.

Foreign Policy Control

The fact that an all-volunteer force is unlikely to alter in any significant way the ethos of the military also has implications for the belief expressed that such a force will foster military adventurism. Some imagine that military men by virtue of their training and profession are desirous of testing their expertise and of seeking military solutions to problems. Even if true, we have indicated that this attitude will not be altered by inclusion of conscripts in the ranks. It will be as prevalent amongst those who lead a mixed-force as amongst those who would lead an all-volunteer force - those leaders being one and the same.

But perhaps adventurism is not the product of military attitudes but rather of less public concern about the use of the armed forces. It may be thought, for instance, that public discussion is much more likely to be generated if the draft is used to fight a war than if volunteer troops are used. The implication is that the size and depth of public interest in foreign policy is increased where the draft is involved.

This is a conclusion well-supported by our earlier analysis of the fiscal politics of conscription which indicated

that interdependent utility motives rather than self-interested pecuniary motives may carry considerable weight in the political choice of military manpower procurement systems. The political participation (voting, lobbying, demonstrating, etc.) of concerned relatives and friends of draftees may well be a more efficient check on military adventurism than the equivalent activities of the beleagured taxpayer faced with the prospect of an increase in an all-volunteer force size.

There will, of course, be some who would wish the public's role in formulation of defense policy to be diminished anyway, and hence support the all-volunteer force on the grounds that it inhibits the freedom of action of the military less than a draft. In national security matters the view is indeed quite common that the state knows better than its citizens what is best for the national well-being.

But this is a dangerous argument with crucial limitations, for state power has been known to be predatory and, even if well-motivated, fallible. It should be obvious, after all, that in a war one side at least must be encouraging evil. There may be a presumption that our own nations are not aggressors, but in matters of this moment we must be sure there are no mistakes. Appeals to the "weight of the authority and knowledge of the Commonwealth Government", as the Anglican Synod in Australia once termed it approvingly, must be treated with caution and used sparingly.

Does it follow that a draft is to be advocated to help limit foreign and defense policy excesses? One suspects that there are other alternatives which can be built into the system of political checks and balances and which would be a better control than conscription. Senator George McGovern has characterised the difficulties in relying upon conscription as our check as follows: "We tell the young draftee, "You go fight, take injuries and be killed in a mistaken war. Then perhaps your parents and friends will start objecting and others like you who have not yet been called will start protesting, and then they'll create a political climate in which we can act safely.""[40] Clearly we should seek more effective and worthy means of democratic control of government foreign policy.

We should also recognise that using conscription in this way as a check on government can produce what may be one of the most damaging real costs of all of conscription if we resort to a draft in times other than major need when the nation is threatened. A peacetime draft may well actually erode patriotism and produce alienation of those who are subject to it. And this is an observation that is more than a value judgement since it is borne out by the experience of the U.S. and Australia prior to any conscript involvement in the Vietnam War. Both countries were experiencing considerable agitation by youth over the draft. In peacetime,

it was difficult for many of the young to accept the compulsion of a draft as valid.

Of course many young men fully accepted the obligations imposed upon them. But others reacted by opposition, bitterness and resentment and by withdrawal and alienation from social commitment. There may have been other factors producing or contributing to this but the draft was the most frequently expressed focus for the discontent of the time.

Irrespective of whether those who were unhappy with a peacetime draft were justified or not, the fact remains that this discontent produces significant erosion of social harmony. When a generation of hostility is produced, and the law is ridiculed and the whole political process is called into question by a significant proportion of the nation's young men, it certainly bears asking whether this is a cost worth paying for the other presumed advantages of peacetime conscription. Of course some may see this as actually a benefit, but this is not likely to be a widely-shared view.

Moreover it may be that the use of voluntarism in peacetime for the standing military, supported by reserves and a back-up draft, may well be a more effective "package" for producing maximum responsibility in the use of military manpower. For then the need to call-up reserves and to commence draft calls, rather than to possess the latter as an ongoing institution, will ensure the maximum public attention is paid to the nation's military involvements at the beginning of any significant commitment.

CHAPTER 6. SUMMARY AND CONCLUSION

> "Is this the age of volunteers anywhere else in the world? Do other countries rely on volunteers and a territorial army? In America? No. In Britain? No."
>
> Sir Wilfred Kent-Hughes
> Commonwealth Parliamentary Debates, 1959

The military manpower requirements of the United States and Australia have changed in recent years. The needs imposed by involvement in actual hostilities have given way to a strategic requirement for a peacetime standing military. The geographical isolation of the two countries has meant that this standing military be oriented at maintaining a basic military capability and framework for expansion, rather than territorial defense. Correspondingly, there is a need to assess the form of military manpower procurement appropriate to these changed circumstances.

During the Vietnam hostilities, both Australia and the United States used a draft to supplement voluntary recruitment to the regular forces. In the Post-Vietnam era, the broad alternatives are to continue with some form of conscription (universal, selective, or lottery) or adopt all-volunteer procurement.

There is a literature in economics which sees the adoption of all-volunteer forces as unlikely, even in peacetime, due to the pecuniary advantages accruing to the tax-paying majority in a democracy with a draft. Investigation of this proposition, including empirical analysis of an Australian referendum on conscription, indicated that voting on the draft issue is not readily predictable on the basis of fiscal interest alone, and that more attention to the inter-dependent utility aspects is required to understand voting on the question. A draft is not a foregone conclusion in a democratic state.

If a volunteer military may possibly be accepted for peacetime military manpower procurement, we must ask what are the conditions which will ensure sufficient supply to meet specified military manning demands. To answer this, we examined how the procurement alternatives themselves affect the level of accessions needed to provide a given military capability, and it was found that a volunteer force would require considerably fewer accessions than a draft system, due to less labor turnover and fewer training and support personnel. This reduction in accessions requirements could be achieved without any necessary reduction in quality of personnel and indeed might well represent an important gain in motivation and experience.

Since there is no question that an appropriately structured draft can obtain the accessions required of it, at least

in the absence of widespread non-complicance with draft law, the task then becomes a study of the conditions under which the required voluntary accessions will be forthcoming. To do this, a model of military-civilian occupational choice was specified, and appropriate estimating forms for the supply of volunteer enlistees as a proportion of population were derived. Regression estimates of the parameters of the estimating forms were then obtained, and for Britain and Canada as well as the United States and Australia, since the former two countries offered valuable additional evidence on the long-term operation of an all-volunteer system.

The derived equations proved useful estimators and provided a basis for analyzing voluntary recruitment in the four countries. The effects on enlistment supplies of variations in military and civilian pay, unemployment, draft pressure, quality levels ard taste changes were given particular attention. Pay levels had the expected influence upon enlistments, though for Australia and the United States there were some estimation difficulties due to collinearity and insufficient variation in the data series. Resort to additional evidence however, permitted satisfactory interpretation. The effect of unemployment varied with the country studied, reflecting differing labor market structures, and the effect of draft pressure in inducing enlistments varied with the level of draft calls and with the form of the draft. Changes in

quality levels demanded and offered were highly significant determinants of variations in enlistment rates in all the countries studied, and taste changes over the Vietnam period also proved an important influence for U.S. enlistments. Using the supply equations, illustrative calculations of budget cost of manpower procurement under all-volunteer and with-draft alternatives were presented.

The question that remained was, given that the budget cost of a volunteer force usually exceeds that of a force using the draft (not withstanding the lower accessions requirements), should a volunteer system be adopted? Emphasising the peacetime context, various criteria under which this problem could be examined were enunciated. It was found that a peacetime draft for a professional standing military would impose significant real economic costs that would not obtain under a volunteer force (particularly preference abrogation, uncertainty and avoidance costs), and that a volunteer force would better serve the distributional criterion of equity in taxation (individual equity), without significant violation of the criterion of equity in condition (group equity).

Commonly suggested difficulties with a volunteer force in the area of expansion flexibility and in problems of praetorianism were found to be not really affected by the procurement system adopted for the regular forces and were better dealt with by alternative mechanisms. This meant particularly the establishment of a ready-reserve system,

possibly by lottery draft, and the maintenance of stand-by draft arrangements for meeting emergencies and for prolonged or major hostilities. A draft for reserves would be especially appropriate if it is desired to offset the individualist values of a volunteer active duty force with the collectivist values of a draft. A stand-by draft for major expansion is readily justified by its administrative, budgetary and equity advantages in the situation of large-scale conflict. For peacetime however, the balance of advantage would seem to lie with all-volunteer recruitment for the active-duty forces, particularly for the strategic circumstances of no territorial threat to the nation.

DATA APPENDICES

DATA APPENDIX: CHAPTER 2

The Australian Conscription Referendum of 1917: Cross-Section Regression Analysis

Data:

	VOT	AGE	FEMALE	RELIG	BIRTH	RURAL	AFOS
NSW - M	0.3003	0.5691	0.5297	0.1226	0.2076	0.0437	0.0442
-NM	0.3370	0.4909	0.4627	0.2378	0.1293	0.5184	0.0407
VIC - M	0.4615	0.4659	0.5548	0.2054	0.1781	0.0480	0.0462
-NM	0.5050	0.5656	0.4917	0.2168	0.1326	0.5386	0.0495
QLD - M	0.4491	0.5249	0.5263	0.2208	0.2903	0.0701	0.0541
-NM	0.4114	0.5209	0.4451	0.2373	0.2460	0.5313	0.0507
SA - M	0.4476	0.5123	0.5446	0.1331	0.1652	0.0861	0.0502
-NM	0.4078	0.5183	0.4707	0.1270	0.1143	0.5424	0.0398
WA - M	0.6572	0.4750	0.5286	0.1856	0.2497	0.0807	0.0776
-NM	0.6064	0.7728	0.3947	0.2203	0.2588	0.6230	0.0812
TAS - M	0.5038	0.5038	0.5602	0.1542	0.1117	0.1094	0.0442
-NM	0.4892	0.5572	0.4858	0.1548	0.0792	0.5889	0.0418

M = Metropolitan. NM = Non-Metropolitan

For sources and notation see p. 34.

DATA APPENDIX: CHAPTER 3

Re-enlistment Analysis: Australia, quarterly, 1966(3) to 1972(2)

Data:

Quarter	NRERA	WR	UR	S	N	T
1966 (3)	10.7	.819	.388	.799	.355	0
(4)	9.0	.814	.400	.780	.265	1
1967 (1)	17.7	.819	.398	.812	.456	2
(2)	15.3	.809	.411	.835	.425	3
(3)	18.2	.812	.428	.786	.455	4
(4)	13.4	.803	.398	.790	.335	5
1968 (1)	23.1	.803	.410	.799	.575	6
(2)	14.5	.803	.411	.745	.377	7
(3)	15.9	.793	.390	.825	.444	8
(4)	12.8	.783	.393	.807	.365	9
1969 (1)	22.3	.770	.374	.784	.550	10
(2)	19.5	.783	.353	.723	.501	11
(3)	16.6	.768	.328	.740	.456	12
(4)	12.3	.770	.345	.745	.325	13
1970 (1)	17.6	.753	.314	.766	.526	14
(2)	16.7	.737	.308	.666	.445	15
(3)	21.4	.729	.374	.696	.534	16
(4)	14.4	.730	.379	.729	.356	17
1971 (1)	27.9	.720	.402	.666	.646	18
(2)	17.5	.754	.441	.650	.467	19
(3)	15.9	.825	.523	.699	.517	20
(4)	11.3	.815	.582	.710	.381	21
1972 (1)	16.3	.793	.661	.741	.610	22
(2)	13.5	.778	.704	.687	.458	23
MEAN	16.4	.783	.421	.749	.451	11.5

Notation:

NRERA = non-re-enlistments army, male enlistees, as proportion of total enlisted strength.
WR = pay ratio: (Corporal with Grade 1 military skill / Average weekly earnings per employed male unit, civilian).
UR = average male unemployment rate, seasonally adjusted.
S = proportion of six-year men in those coming due.
N = proportion of enlisted strength coming due for re-enlistment.
T = time dummy variable.

Source: Unpublished data provided by the Directorate of Manning, Army Headquarters, Canberra, October 1972.

DATA APPENDIX: CHAPTER 4.

I. Supply Analysis - Symbols for Variables

A	Enlistment Applications
AD	Recruitment advertising expenditure
CPI	Consumer Price Index
C	Casualties
E	Enlistments
ET	Enlistment term of engagement
I	Inductions
L	Natural Logarithm
LF	Labor Force
PO	Public opinion
QA	Quality acceptance
RE	Re-enlistment
RP	Recruiting personnel
S	Seasonal
TP	Total population
U	Unemployment
V	Vietnam
WC	Civilian wage
WM	Military wage
WR	Relative wages

Notes:

1. The addition of 'A', 'D', 'R' or 'DV' to the above symbols indicates 'Army', 'Total Defence', 'Rate' or 'Dummy Variable' respectively.
2. The addition of numbers to the above symbols indicates alternative definitions of the variables.
3. The preface symbol "LG' indicates that the variable is lagged.

II. Data Sources and Notes:

AUSTRALIA, quarterly, 1966(3) - 1973(4).

1. EA, QARA, WM, IA:

Unpublished data, Directorate of Manning, Army Headquarters, Canberra, (May 1972 & October 1974). Enlistments also excluded apprentice enlistments.

2. ED, QARD, RPA:

Unpublished data, Director-General of Recruiting, Department of Defence, Canberra, (August & October 1974) Army Recruiting Personnel figures are establishment, as distinct from actual posted strength. Civilian staff and recruiting assistance through the Commonwealth Employment Service and Honorary Recruiting Secretaries in country areas is not included.

3. TPI, TP2, LF:

TP1 referred to total population males ages 15-19 last birthday and TP2 referred to total population males aged 20 last birthday. The source for both series was Commonwealth Bureau of Census and Statistics. Demography, annual bulletin, for figures to 1972, and Commonwealth Bureau of Census and Statistics, Projections of the Population of Australia, 1968-2001, including Immigration, mimeographed, December 1972, for post 1972 estimates. The data provided were annual as of June. Linear interpolation provided quarterly estimates. LF was the civilian labor force of 15-19 year old males, as given by Commonwealth Bureau of Census and Statistics, The Labor Force, quarterly bulletin.

4. WC, CPI:

WC was estimated using average weekly earnings per employed male unit and CPI was the consumer price index, all groups. The source for both series was Commonwealth Bureau of Census and Statistics, Quarterly Summary of Australian Statistics, quarterly bulletin. An adjustment was made to the official civilian wage series to compensate for the removal of trainee teachers from the series as from 1971(3). A deduction of 30 cents (1971) was made from the official series for each quarter, 1971 (3) to 1973 (3).

5. U:

The unemployment figures were males under 21 registered as unemployed and awaiting placement. The source was Department of Labour, Monthly Review of the Employment Situation.

6. PO:

The public opinion variable was estimated as the proportion of the sample surveyed who responded affirmatively to Gallup poll questions on "should we keep our troops in Vietnam?", as given in Roy Morgan Research Centre, Australian Gallup Polls, quarterly. Sample size is 2200. Linear interpolation was employed to provide estimates for quarters when this question was not asked. This was a severe assumption for the period 1971(3) - 1972(3). For the period from 1973(1) - 1973(4) constancy of tastes was assumed in the absence of a further observation.

CANADA, annual, by region, 1969-1973.

1. ED, QARD, WM:

All military data were unpublished statistics provided by the Personnel Applied Research Unit, National Defence Headquarters, Ottawa, (October 1974). Although requested, quarterly national data were not provided. Instead the only data made available were annual, for the following regions: Maritime, Quebec, Central (Ontario), and Western. Regional dummy variables employ the symbols SM, SQ, SC. Western Canada was the base region. The enlistment data refer to male unskilled recruits only.

2. WC:

The civilian earnings series was based on average weekly wages and salaries, industrial composite, for each region. The Western region figure was derived as a weighted average of component province series, using province labor force as the weight. The source was Statistics Canada, Employment, Earnings and Hours, Catalogue No. 72-002, monthly.

3. LF, U:

Civilian labor force and unemployment, males, by region were the series used for estimation. No age breakdown was available at the regional level. The series were published in Statistics Canada, Historical Labour Force Statistics (1973), Catalogue No. 72-201, annual.

4. CPI:

Consumer price index, all items, by major city for each region: Statistics Canada, Prices and Price Indexes, Catalogue 62-002, monthly.

GREAT BRITAIN, quarterly, 1966(3)-1973(3).

1. EA, ED, WM, ADA, QARA, ETDV:

All military data were unpublished statistics provided by Defence Statistics Branch, Ministry of Defence, London, (September 1974). Enlistment figures are for the United Kingdom and include apprentices and young soldier entrants, as well as adult recruits. The army advertising figure is direct expenditure on all media. The enlistment term dummy variable reflects the introduction of a new shorter three year service engagement option, from 1972(3), for Army enlistment.

2. LFI, LF2, U2:

LF1 is the number of male civilian employees, 15-19 years old. The estimate includes Northern Ireland. An adjustment was made to this labor force data from 1973(4) to allow for the estimated 141,000 15 year old males who did not leave school owing to the increase in the school-leaving age in September 1973. (Department of Employment, Gazette, April 1974, p. 309). LF2 is the number of male employees, Great Britain. This was the base for the unemployment figures, which referred to total male unemployed, Great Britain. Age specific estimates are not available on a quarterly basis so that quarterly data for all males was used for determining unemployment rate. Short term fluctuations are less important for LF1, however, so that the quarterly series there was derived from annual age-specific figures (at June) by linear interpolation. It is apparent that British statistics in this area are somewhat deficient. Even for the annual age-specific employment and unemployment data there is a two year lag in their provision even in unpublished form. Our source was Department of Employment, British Labor Statistics Yearbook, 1971, Table 93, and unpublished data provided by the Department of Employment, London, (October 1974).

3. WC, CPI:

The civilian wage series was the monthly index of average earnings, in Central Statistical Office,

Annual Abstract, 1973, Table 163, and updated from Department of Employment, Gazette, monthly. CPI was the general index of retail prices, all items, given in Central Statistical Office, Economic Trends, December 1973.

UNITED STATES, quarterly, 1966(3) - 1974(1).

1. EA, ED, WM, RPA, QARA, QARD, IA, ID:

Enlistments and inductions data, army and defense, were from Armed Forces Examining and Entrance Station Qualitative Distribution Report of Male Enlistments, Inductions and Rejections, Headquarters, U.S. Army Recruiting Command. The quality acceptance data were also from this source, though note the different definition of quality acceptance used here compared to the other countries. The estimate here is proportion of Mental Group IV enlistments in total enlistments, (Mental Groups I-IV) Army recruiting personnel numbers were provided by Headquarters, U.S. Army Recruiting Command, Fort Sheridan, Illinois (October 1974). The military wage figure was total monthly regular military compensation for a recruit, and was provided by the Office of the Assistant Secretary of Defense, Manpower and Reserve Affairs, Washington (August, 1974).

2. TP1, TP3, LF, U, WC:

TP1, LF and U referred to the total population, civilian labor force and number unemployed respectively, for males aged 16-19 years. The sources were U.S. Department of Commerce, Bureau of Census, Current Population Reports, Series P-20, for the total population figure, and U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, for the latter two series. Civilian earnings also came from Employment and Earnings, and referred to gross average weekly earnings of production or non-supervisory workers on private non-agricultural payrolls. TP3 was used as the base for induction rate calculations and was estimated as the total population of 18-24 year old males, as given in Current Population Reports, Series P-20. Estimates of TP1 and TP3 beyond 1971 were unpublished estimates obtained from the Bureau of Census, Population Division, National Population Estimates and Projections Branch, Washington (September 1974). Quarterly total population estimates were formed by linear interpolation from the official annual (July) estimates.

3. CPI, PQ:

The consumer price index was from Department of Commerce, Office of Business Economics, Survey of Current Business. The public opinion estimate was the proportion of those sampled (n = 1500) who responded negatively to the question, "Do you think the U.S. made a mistake sending troops to fight in Vietnam?" The source was George H. Gallup, The Gallup Poll: Public Opinion, 1935-1971, New York: Random House, 1972, Volume 3: 1959-1971. Post-1971 data came from unpublished tabulations based on computer stored records of Gallup polls at the Roper Public Opinion Research Center, Williams College, Williamstown, Massachusetts, (September 1974). Linear interpolation provided quarterly data from 1971(4) to 1972(4), and no change in tastes was assumed after 1973(1) when the question was asked by Gallup polls for the last time.

AUSTRALIA, quarterly by state, 1966(3) - 1973(3).

1. EA, WM, IA, QARA:

All military data were defined as for the national quarterly data and came from the same source: Directorate of Manning, Army Headquarters, Canberra, (September 1972 and November 1974). The data were provided on a Military Command basis which corresponds closely to Australian state boundaries.

2. TP1, TP2, U:

The population base for calculating the enlistment rate was TP1, the total population of males aged 17-24 years last birthday, by state. The population base for the induction rate was TP2, the total population of 20 year old males in each state. The source for both series was unpublished data on population projections provided by the Bureau of Census and Statistics, Canberra, (July 1972). The figures were as of June each year, and quarterly data was estimated by linear interpolation. The unemployment series was junior males (under 21) registered unemployed and awaiting placement, as given by the Department of Labour, Monthly Review of the Employment Situation. The population base for determining the unemployment rate was TP1.

3. WC, CPI:

The civilian wage was average weekly earnings per employed male unit in the capital city of each state.

The consumer price index is also that for the capital cities. No alternative state compilations are available. The source for both series is the Commonwealth Bureau of Census and Statistics, Quarterly Summary of Australian Statistics.

4. SN, SV, SQ, SS, SW:

These are dummy variables for each state except Tasmania which is the excluded category. The dummy variables employ the first letter of the name of the other five states.

AUSTRALIA, quarterly, 1966(3)-1973(4)

QUARTER	EA	ED	TP1	TP2	LF1	WC
1	576.000	1289.00	533900.	98305.0	346400.	98.7600
2	401.000	793.000	538100.	104270.	333500.	101.610
3	721.000	1573.00	538000.	110235.	358600.	94.7800
4	349.000	1477.00	538700.	116200.	344600.	100.230
5	821.000	1502.00	538700.	114325.	333500.	100.420
6	608.000	1098.00	541000.	112450.	329800.	104.560
7	1218.00	2127.00	544000.	110575.	348000.	97.3900
8	897.000	1879.00	547600.	108700.	331900.	102.870
9	796.000	1424.00	549700.	108459.	320600.	103.400
10	625.000	1100.00	551600.	108218.	316100.	109.680
11	1110.00	1876.00	556500.	107977.	355700.	104.470
12	339.000	1747.00	559300.	107735.	339200.	110.210
13	756.000	1421.00	560500.	108687.	325700.	111.530
14	533.000	905.000	562600.	110039.	327500.	120.980
15	960.000	1645.00	565000.	111191.	356000.	107.390
16	698.000	1405.00	568000.	112342.	340700.	115.670
17	744.000	1217.00	570700.	112714.	332400.	117.890
18	451.000	813.000	572900.	113086.	328000.	122.880
19	872.000	1735.00	575600.	113458.	349500.	116.300
20	777.000	1460.00	579500.	113830.	341200.	124.170
21	751.000	1588.00	583100.	114448.	331600.	122.220
22	551.000	970.000	585300.	115066.	329300.	127.360
23	1198.00	1978.00	586800.	115684.	350000.	117.240
24	987.000	1739.00	590600.	116301.	335400.	125.980
25	906.000	1446.00	592700.	117118.	331700.	124.380
26	521.000	817.000	593900.	117935.	343200.	132.200
27	1350.00	2002.00	596200.	118752.	361300.	120.900
28	1008.00	2499.00	601900.	119569.	351600.	129.860
29	743.000	2743.00	601600.	119541.	347500.	128.030
30	402.000	510.000	603800.	119513.	356400.	134.640

AUSTRALIA (continued)

QUARTER	WM2	U1	RPA	QARA	QARD	IA
1	101.690	6671.00	57.0000	0.305400	0.341900	2081.00
2	100.750	18916.0	57.0000	0.244800	0.255800	2115.00
3	100.860	9269.00	57.0000	0.265100	0.312800	2260.00
4	99.8500	9030.00	57.0000	0.343700	0.340800	2166.00
5	99.8000	6528.00	57.0000	0.339400	0.343400	2035.00
6	99.5000	21983.0	72.0000	0.318700	0.322700	1954.00
7	99.1100	9409.00	72.0000	0.402600	0.358000	2272.00
8	98.3300	8617.00	72.0000	0.423700	0.439800	2271.00
9	97.9500	5847.00	72.0000	0.356800	0.351100	2154.00
10	99.2600	23361.0	83.0000	0.335500	0.319400	1972.00
11	99.3100	9155.00	83.0000	0.377700	0.333400	2305.00
12	98.5500	7666.00	87.0000	0.381400	0.364100	2197.00
13	97.9900	5824.00	87.0000	0.355100	0.208100	2143.00
14	97.1700	24830.0	87.0000	0.277600	0.266600	2139.00
15	103.700	8094.00	92.0000	0.350200	0.330900	2102.00
16	102.370	7030.00	104.000	0.309500	0.357200	2189.00
17	101.750	7706.00	104.000	0.306000	0.295900	2000.00
18	102.620	29592.0	106.000	0.253600	0.221200	1775.00
19	108.740	11891.0	106.000	0.298900	0.322100	2181.00
20	106.850	11453.0	191.000	0.318200	0.320500	2284.00
21	104.920	10965.0	192.000	0.295200	0.365000	2075.00
22	102.490	40830.0	192.000	0.241900	0.238800	1726.00
23	119.460	19814.0	192.000	0.288300	0.277800	2361.00
24	121.280	18082.0	192.000	0.301400	0.331400	2384.00
25	119.610	14835.0	192.000	0.299000	0.304000	2151.00
26	118.180	47415.0	239.000	0.210000	0.198600	2137.00
27	125.050	15934.0	239.000	0.337900	0.315500	1.00000
28	130.410	14466.0	239.000	0.348200	0.551700	1.00000
29	125.750	10676.0	239.000	0.351100	0.449900	1.00000
30	124.230	43143.0	239.000	0.248800	0.175700	1.00000

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AUSTRALIA (continued)

QUARTER	PC
1	0.630000
2	0.640000
3	0.650000
4	0.620000
5	0.550000
6	0.630000
7	0.580000
8	0.610000
9	0.650000
10	0.540000
11	0.480000
12	0.480000
13	0.480000
14	0.400000
15	0.400000
16	0.410000
17	0.410000
18	0.420000
19	0.390000
20	0.370000
21	0.370000
22	0.360000
23	0.350000
24	0.350000
25	0.340000
26	0.330000
27	0.320000
28	0.320000
29	0.320000
30	0.320000

GREAT BRITAIN, quarterly, 1966(3)-1973(3)

QUARTER	EA	ED	LF1	LF2	WC	WM2
1	7815.00	11823.0	0.150000E 07	0.146650E 08	99.5200	101.360
2	5378.00	8677.00	0.146700E 07	0.144970E 08	97.9100	99.7200
3	5863.00	9372.00	0.143400E 07	0.142460E 08	97.4500	99.0200
4	5397.00	9013.00	0.140500E 07	0.143580E 08	99.6700	101.310
5	6294.00	10023.0	0.148000E 07	0.144020E 08	101.400	100.700
6	3362.00	6409.00	0.145500E 07	0.142870E 08	101.430	98.8200
7	3648.00	6267.00	0.142500E 07	0.140800E 08	103.230	98.5800
8	4221.00	6407.00	0.130000E 07	0.141510E 08	102.930	105.170
9	5918.00	9651.00	0.127500E 07	0.141780E 08	103.160	103.160
10	2984.00	5693.00	0.125000E 07	0.141690E 08	103.780	101.500
11	3709.00	6316.00	0.122500E 07	0.140200E 08	104.120	100.510
12	5343.00	7951.00	0.120300E 07	0.140270E 08	105.250	104.700
13	7243.00	11310.0	0.119300E 07	0.140350E 08	105.950	103.410
14	3807.00	7347.00	0.118300E 07	0.139870E 08	106.990	101.670
15	4213.00	7669.00	0.117300E 07	0.138800E 08	108.450	99.9300
16	6380.00	10060.0	0.116400E 07	0.138320E 08	110.890	123.920
17	7334.00	11178.0	0.116100E 07	0.138350E 08	112.000	121.350
18	4000.00	8365.00	0.115800E 07	0.138230E 08	112.980	118.470
19	5720.00	9286.00	0.115500E 07	0.135790E 08	113.240	115.950
20	7836.00	11698.0	0.115200E 07	0.135420E 08	112.550	124.450
21	9737.00	14658.0	0.114100E 07	0.134010E 08	113.180	121.820
22	6061.00	10082.0	0.113000E 07	0.134250E 08	113.310	119.760
23	6799.00	10060.0	0.111900E 07	0.133280E 08	115.340	118.340
24	7189.00	10359.0	0.110700E 07	0.134180E 08	118.240	131.790
25	9447.00	13126.0	0.109200E 07	0.134590E 08	119.090	128.320
26	3990.00	7865.00	0.107700E 07	0.135300E 08	121.860	124.920
27	5108.00	7668.00	0.106200E 07	0.135150E 08	122.020	123.520
28	3508.00	5618.00	0.104800E 07	0.135760E 08	122.990	128.300
29	4077.00	7102.00	0.107300E 07	0.135630E 08	125.010	125.790

GREAT BRITAIN (continued)

QUARTER	U2	ADA	QARA	ETCV	CPI
1	253000.	201230.	0.615400	0.0	97.9900
2	373000.	197751.	0.504800	0.0	98.7400
3	421000.	230330.	0.466300	0.0	99.3300
4	378000.	126823.	0.461600	0.0	100.170
5	424000.	300154.	0.581100	0.0	99.6600
6	461000.	205548.	0.441100	0.0	100.840
7	477000.	199634.	0.353300	0.0	102.260
8	429000.	88801.0	0.437500	0.0	104.690
9	448000.	262759.	0.598600	0.0	105.280
10	457000.	231622.	0.452700	0.0	106.530
11	484000.	224682.	0.311500	0.0	108.630
12	415000.	120468.	0.427200	0.0	110.390
13	455000.	192741.	0.609300	0.0	110.550
14	483000.	129003.	0.463700	0.0	111.980
15	517000.	182395.	0.326200	0.0	114.070
16	450000.	138569.	0.431600	0.0	116.830
17	487000.	205707.	0.565900	0.0	118.170
18	513000.	122409.	0.401900	0.0	120.600
19	590000.	220066.	0.350000	0.0	123.870
20	589000.	93367.0	0.441300	0.0	128.310
21	677000.	210736.	0.586600	0.0	130.070
22	732000.	153470.	0.502900	0.0	131.740
23	780000.	170230.	0.384300	0.0	133.750
24	648000.	50260.0	0.412600	0.0	136.240
25	699000.	207615.	0.659600	1.00000	138.530
26	620000.	103739.	0.474300	1.00000	141.880
27	569000.	183941.	0.506100	1.00000	144.350
28	462000.	161363.	0.422000	1.00000	148.990
29	453000.	183855.	0.424700	1.00000	151.260

CANADA, annual, by region, 1969-1973

YEAR		ED	LF	WC	WM	U	QARD
1969	.	1043.00	452500.	4.22000	2.40000	40500.0	0.284119
1969	.	1716.00	0.158325E 07	4.95000	2.40000	122830.	0.266046
1969	.	1872.00	0.203158E 07	5.27000	2.40000	66910.0	0.265457
1969	.	1615.00	0.149267E 07	5.16000	2.40000	57670.0	0.281752
1970	.	1060.00	457580.	4.52404	2.45339	41660.0	0.306536
1970	.	1901.00	0.160733E 07	5.19099	2.44858	140750.	0.286554
1970	.	1735.00	0.208867E 07	5.55556	2.43665	95170.0	0.286351
1970	.	1816.00	0.153025E 07	5.37270	2.42014	96160.0	0.348627
1971	.	910.000	466920.	4.80193	2.60870	47420.0	0.269789
1971	.	1884.00	0.162683E 07	5.50529	2.59865	152660.	0.254836
1971	.	1575.00	0.213825E 07	5.94439	2.58869	117170.	0.297394
1971	.	1332.00	0.156792E 07	5.60377	2.54717	90750.0	0.319118
1972	.	1173.00	477750.	5.01380	2.66789	50750.0	0.363721
1972	.	2221.00	0.164467E 07	5.73679	2.68767	147920.	0.406628
1972	.	1838.00	0.221133E 07	6.18433	2.67281	111660.	0.352919
1972	.	1308.00	0.160417E 07	5.96364	2.63636	94420.0	0.359341
1973	.	315.000	501920.	5.05522	2.80374	50500.0	0.103687
1973	.	609.000	0.170117E 07	5.77759	2.86707	134750.	0.106301
1973	.	520.000	0.227050E 07	6.19828	2.84483	91670.0	0.100619
1973	.	386.000	0.163350E 07	6.03242	2.81570	83080.0	0.112307

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CANADA (continued)

YEAR	SM	SQ	SC	CPI
1969	1.00000	0.0	0.0	100.000
1969	0.0	1.00000	0.0	100.000
1969	0.0	0.0	1.00000	100.000
1969	0.0	0.0	0.0	100.000
1970	1.00000	0.0	0.0	101.900
1970	0.0	1.00000	0.0	102.100
1970	0.0	0.0	1.00000	102.600
1970	0.0	0.0	0.0	103.300
1971	1.00000	0.0	0.0	103.500
1971	0.0	1.00000	0.0	103.900
1971	0.0	0.0	1.00000	104.300
1971	0.0	0.0	0.0	106.000
1972	1.00000	0.0	0.0	108.700
1972	0.0	1.00000	0.0	107.900
1972	0.0	0.0	1.00000	108.500
1972	0.0	0.0	0.0	110.000
1973	1.00000	0.0	0.0	117.700
1973	0.0	1.00000	0.0	115.100
1973	0.0	0.0	1.00000	116.000
1973	0.0	0.0	0.0	117.200

UNITED STATES, quarterly, 1966(3)-1974(1)

QUARTER	EA	ED	TP1	TP3	LF1	WC
1	56566.0	148239.	0.911600E 07	0.108860E 08	0.420600E 07	102.210
2	49897.0	409668.	0.911400E 07	0.110060E 08	0.332300E 07	101.550
3	39516.0	95264.0	0.911200E 07	0.111260E 08	0.316400E 07	100.430
4	37186.0	99561.0	0.911000E 07	0.112450E 08	0.376600E 07	101.120
5	51795.0	130423.	0.915500E 07	0.113150E 08	0.414400E 07	102.900
6	42686.0	107772.	0.920000E 07	0.113850E 08	0.325300E 07	102.280
7	52603.0	125467.	0.924500E 07	0.114550E 08	0.307900E 07	101.770
8	49143.0	123869.	0.928900E 07	0.115230E 08	0.382300E 07	102.930
9	56587.0	144461.	0.934700E 07	0.116290E 08	0.441700E 07	104.730
10	41199.0	122828.	0.940500E 07	0.117350E 08	0.340400E 07	103.850
11	45458.0	125955.	0.946300E 07	0.118410E 08	0.334600E 07	103.080
12	38461.0	123931.	0.952000E 07	0.119480E 08	0.395600E 07	104.090
13	49562.0	122049.	0.959100E 07	0.120690E 08	0.457800E 07	105.270
14	37246.0	91650.0	0.966200E 07	0.121890E 08	0.359900E 07	104.350
15	37827.0	93466.0	0.973300E 07	0.123100E 08	0.352000E 07	102.400
16	31582.0	81105.0	0.980600E 07	0.124330E 08	0.409800E 07	102.290
17	37006.0	96553.0	0.985700E 07	0.125680E 08	0.465200E 07	103.980
18	33868.0	84852.0	0.990800E 07	0.127030E 08	0.375100E 07	102.450
19	40942.0	100625.	0.995900E 07	0.128380E 08	0.363400E 07	102.690
20	34616.0	87616.0	0.100120E 08	0.129740E 08	0.421100E 07	104.250
21	43994.0	112541.	0.100700E 08	0.129880E 08	0.484400E 07	105.690
22	32029.0	85441.0	0.101280E 08	0.130020E 08	0.395200E 07	105.930
23	38329.0	86673.0	0.101860E 08	0.130160E 08	0.393300E 07	106.010
24	36269.0	89989.0	0.102440E 08	0.130300E 08	0.453400E 07	107.700
25	58424.0	140167.	0.102910E 08	0.130910E 08	0.514600E 07	109.590
26	46215.0	98428.0	0.103380E 08	0.131520E 08	0.421300E 07	109.630
27	34414.0	79475.0	0.103850E 08	0.132130E 08	0.407400E 07	108.080
28	24771.0	71072.0	0.104330E 08	0.132720E 08	0.472500E 07	108.620
29	41524.0	98279.0	0.104570E 08	0.133330E 08	0.533200E 07	109.640
30	38122.0	75980.0	0.104810E 08	0.133940E 08	0.449500E 07	107.750
31	41269.0	88516.0	0.105050E 08	0.134550E 08	0.435700E 07	104.380

UNITED STATES (continued)

QUARTER	WM2	U1	RPA	QARA2	QARD2	IA
1	100.120	436000.	1.00000	0.228441	0.130748	107688.
2	99.5700	349000.	1.00000	0.229533	0.784286	97621.0
3	99.5100	396000.	1.00000	0.252303	0.198543	43588.0
4	99.0100	484000.	2323.00	0.247136	0.199335	49770.0
5	97.8600	483000.	2420.00	0.232764	0.196054	77169.0
6	103.620	427000.	2541.00	0.287823	0.225309	58071.0
7	102.430	400000.	2448.00	0.252894	0.229853	96749.0
8	101.330	463000.	2416.00	0.200924	0.195666	106234.
9	104.780	454000.	2402.00	0.252514	0.207495	49089.0
10	103.660	387000.	2475.00	0.288696	0.228515	36477.0
11	102.490	414000.	2518.00	0.292512	0.241086	92200.0
12	100.790	443000.	2465.00	0.262760	0.234219	73040.0
13	106.920	492000.	2647.00	0.258464	0.219740	81387.0
14	105.540	411000.	2729.00	0.328465	0.222182	25425.0
15	110.970	484000.	2760.00	0.218072	0.197676	67123.0
16	109.360	623000.	2777.00	0.190773	0.194427	53739.0
17	108.190	657000.	2777.00	0.197454	0.175872	44171.0
18	107.140	629000.	2887.00	0.318796	0.162188	27978.0
19	112.710	665000.	3168.00	0.240804	0.207374	53889.0
20	111.340	700000.	3807.00	0.227438	0.209003	30061.0
21	110.200	732000.	4574.00	0.240601	0.188491	8092.00
22	158.360	664000.	5407.00	0.935088E-01	0.172669	10743.0
23	189.880	777000.	6248.00	0.177542	0.167803	419.000
24	188.350	696000.	6568.00	0.131435	0.165042	14368.0
25	192.340	715000.	6459.00	0.199233	0.188853	19589.0
26	198.700	640000.	6325.00	0.218609	0.180497	14318.0
27	195.140	617000.	6161.00	0.121753	0.928468E-01	281.000
28	190.420	666000.	5851.00	0.137378	0.764718E-01	234.000
29	185.570	676000.	5702.00	0.240150	0.124716	1.00000
30	190.260	627000.	7285.00	0.193196	0.964198E-01	1.00000
31	194.700	693000.	7368.00	0.256585	0.104478	1.00000

UNITED STATES (continued)

QUARTER	ID	PO	CPI
1	107730.	0.530000	97.8000
2	97642.0	0.560000	98.5000
3	43625.0	0.630000	98.7000
4	49801.0	0.600000	99.4000
5	77209.0	0.620000	100.500
6	58108.0	0.500000	101.300
7	96800.0	0.510000	102.400
8	111480.	0.540000	103.500
9	49135.0	0.450000	104.800
10	38836.0	0.520000	106.100
11	94812.0	0.470000	107.300
12	79087.0	0.420000	109.100
13	82458.0	0.360000	110.700
14	28567.0	0.390000	112.200
15	70966.0	0.410000	113.900
16	53765.0	0.430000	115.700
17	44187.0	0.430000	117.000
18	28045.0	0.420000	118.600
19	53927.0	0.410000	119.500
20	30071.0	0.340000	120.800
21	8102.00	0.340000	122.000
22	10743.0	0.330000	122.700
23	419.000	0.320000	123.700
24	14377.0	0.320000	124.700
25	19589.0	0.310000	125.800
26	14318.0	0.300000	126.900
27	281.000	0.290000	128.700
28	234.000	0.290000	131.500
29	1.00000	0.290000	134.400
30	1.00000	0.290000	137.600
31	1.00000	0.290000	141.400

AUSTRALIA. quarterly by state, 1966(3)-1973(3)

YEAR-QTR	EA	TP	WC	WM	U	QARA	IA	CPI
1966 - 3(N)	169	290786	0.620829	0.623559	2802	0.219196	719	98.9
1966 - 3(V)	109	211825	0.631951	0.623559	1655	0.323442	637	98.9
1966 - 3(Q)	96	110402	0.556140	0.623559	807	0.275072	226	98.9
1966 - 3(S)	108	71966	0.573022	0.625456	922	0.493151	225	98.6
1966 - 3(W)	70	56403	0.586032	0.624190	237	0.479452	185	98.8
1966 - 3(T)	18	23603	0.556795	0.625456	248	0.290323	89	98.6
1966 - 4	115	293700	0.638638	0.617317	5574	0.174242	659	99.9
1966 - 4	81	213814	0.650302	0.619177	5911	0.253125	729	99.6
1966 - 4	76	111790	0.579739	0.618556	3819	0.240506	262	99.7
1966 - 4	62	72876	0.579739	0.618556	1925	0.322917	198	99.7
1966 - 4	48	57728	0.599194	0.621047	891	0.489796	177	99.3
1966 - 4	17	23906	0.599798	0.621673	796	0.326923	90	99.2
1967 - 1	175	296614	0.602398	0.618581	3246	0.160403	798	100.1
1967 - 1	163	215803	0.598000	0.619200	1898	0.309886	581	100.0
1967 - 1	145	113178	0.528942	0.617964	2379	0.255282	279	100.2
1967 - 1	120	73786	0.551696	0.617964	1150	0.451128	259	100.2
1967 - 1	81	59053	0.566301	0.617348	314	0.447514	238	100.3
1967 - 1	30	24209	0.551590	0.615507	282	0.517241	105	100.6
1967 - 2	260	299528	0.635015	0.613749	3327	0.264766	769	101.1
1967 - 2	173	217792	0.640748	0.610728	2176	0.349495	599	101.6
1967 - 2	208	114566	0.559406	0.614356	1563	0.433333	306	101.0
1967 - 2	117	74696	0.570443	0.611330	1182	0.481481	264	101.5
1967 - 2	71	60378	0.580709	0.610728	425	0.371728	158	101.6
1967 - 2	17	24512	0.586207	0.611330	357	0.215190	70	101.5
1967 - 3	226	302442	0.632195	0.613561	2586	0.240682	673	102.5
1967 - 3	147	219781	0.642371	0.611176	1739	0.272222	587	102.9
1967 - 3	204	115954	0.562175	0.611770	725	0.495146	303	102.8
1967 - 3	123	75606	0.584795	0.612963	881	0.430070	210	102.6
1967 - 3	80	61703	0.597059	0.616569	246	0.487805	190	102.0
1967 - 3	36	24815	0.564299	0.603551	351	0.461538	72	104.2
1967 - 4	193	305356	0.655005	0.611176	5449	0.264022	670	102.9
1967 - 4	120	221770	0.669894	0.608809	7313	0.294840	511	103.3
1967 - 4	141	117342	0.596116	0.610582	4282	0.463816	340	103.0
1967 - 4	94	76516	0.603921	0.616569	2919	0.339350	177	102.0
1967 - 4	43	63028	0.622439	0.613561	902	0.270440	195	102.5
1967 - 4	12	25118	0.602857	0.598952	1118	0.400000	61	105.0

AUSTRALIA (continued)

YEAR-QTR	EA	TP	WC	WM	U	QARA	IA	CPI
1968 - 1(N)	311	308270	0.620155	0.609399	2759	0.293396	775	103.2
1968 - 1(V)	308	223759	0.611753	0.605877	3315	0.441261	677	103.8
1968 - 1(Q)	235	118730	0.536509	0.605877	2365	0.445920	313	103.8
1968 - 1(S)	175	77426	0.573099	0.612963	1319	0.516224	239	102.6
1968 - 1(W)	136	64353	0.589719	0.609990	402	0.529183	204	103.1
1968 - 1(T)	51	25421	0.563536	0.601818	249	0.354167	64	104.5
1968 - 2	281	311186	0.650961	0.604712	2604	0.387586	834	104.0
1968 - 2	229	225751	0.651717	0.600095	2846	0.420956	605	104.8
1968 - 2	157	120119	0.570108	0.605877	1202	0.446023	346	103.8
1968 - 2	109	78337	0.588292	0.603551	1097	0.465812	209	104.2
1968 - 2	73	65679	0.618269	0.604712	510	0.370558	194	104.0
1968 - 2	48	25722	0.601338	0.601243	358	0.738461	83	104.6
1968 - 3	241	313687	0.652172	0.602395	2026	0.276376	744	104.4
1968 - 3	217	227501	0.651760	0.598383	1944	0.374138	659	105.1
1968 - 3	121	121350	0.577841	0.600669	727	0.391586	290	104.7
1968 - 3	101	79132	0.599308	0.603551	807	0.417355	197	104.2
1968 - 3	69	66817	0.620326	0.602972	343	0.439490	192	104.3
1968 - 3	42	25958	0.570190	0.598952	278	0.617647	72	105.0
1968 - 4	219	316188	0.701505	0.608215	6744	0.332322	507	105.9
1968 - 4	145	229251	0.691509	0.607641	8184	0.307856	669	106.0
1968 - 4	116	122581	0.614435	0.611681	3904	0.347305	269	105.3
1968 - 4	68	79927	0.626426	0.612262	2470	0.348718	219	105.2
1968 - 4	52	67955	0.653003	0.614013	989	0.382353	227	104.9
1968 - 4	24	26194	0.632325	0.608790	1070	0.369231	81	105.8
1969 - 1	260	318689	0.660731	0.607404	2774	0.259481	666	106.7
1969 - 1	300	231001	0.659475	0.607974	2292	0.408163	758	106.6
1969 - 1	230	123812	0.585066	0.612571	2114	0.457256	325	105.8
1969 - 1	170	80722	0.604739	0.614313	1054	0.489914	251	105.5
1969 - 1	96	69093	0.637311	0.613731	527	0.362264	201	105.6
1969 - 1	48	26430	0.596244	0.608545	394	0.571429	104	106.5
1969 - 2	256	321190	0.698885	0.602323	2567	0.344086	749	107.6
1969 - 2	192	232753	0.695395	0.604571	1908	0.369231	612	107.2
1969 - 2	186	125043	0.633114	0.609690	1406	0.408791	332	106.3
1969 - 2	96	81516	0.625940	0.609116	833	0.398340	206	106.4
1969 - 2	70	70231	0.662421	0.605701	544	0.472973	195	107.0
1969 - 2	38	26665	0.630841	0.605701	408	0.457831	103	107.0

AUSTRALIA (continued)

YEAR-QTR	EA	TP	WC	WM	U	QARA	IA	CPI
1969 - 3(N)	252	323411	0.702952	0.597878	2085	0.332893	639	108.4
1969 - 3(V)	152	234594	0.706320	0.602323	1517	0.300990	695	107.6
1969 - 3(Q)	170	125892	0.630297	0.604571	850	0.502959	333	107.2
1969 - 3(S)	89	82335	0.648269	0.606268	576	0.282540	220	106.9
1969 - 3(W)	65	71286	0.680294	0.601764	452	0.467626	184	107.7
1969 - 3(T)	24	26963	0.640296	0.603445	344	0.320000	72	107.4
1969 - 4	168	325632	0.744225	0.591332	7903	0.245255	733	109.6
1969 - 4	121	236435	0.740176	0.598430	8321	0.301746	625	108.3
1969 - 4	101	126741	0.662251	0.600649	3872	0.294461	320	107.9
1969 - 4	73	83154	0.679404	0.604007	2653	0.271375	231	107.3
1969 - 4	47	72341	0.717271	0.596228	1016	0.271676	165	108.7
1969 - 4	28	27261	0.685226	0.599537	1065	0.417910	65	108.1
1970 - 1	229	327853	0.672956	0.627853	2300	0.249184	585	111.3
1970 - 1	190	238276	0.682277	0.641690	2082	0.338681	611	108.9
1970 - 1	179	127590	0.605142	0.641690	1746	0.430288	370	108.9
1970 - 1	180	83973	0.626229	0.644649	1024	0.419580	264	108.4
1970 - 1	113	73396	0.661210	0.635851	603	0.353125	192	109.9
1970 - 1	58	27559	0.606979	0.641690	339	0.604167	80	108.9
1970 - 2	178	330073	0.728964	0.618955	2575	0.228498	734	112.9
1970 - 2	163	240118	0.730203	0.634696	2202	0.325349	677	110.1
1970 - 2	107	128438	0.652424	0.637010	1159	0.307471	278	109.7
1970 - 2	113	84790	0.668182	0.635273	951	0.386986	213	110.0
1970 - 2	114	74452	0.700180	0.627289	853	0.413043	224	111.4
1970 - 2	22	27858	0.676095	0.637591	390	0.372881	63	109.6
1970 - 3	215	331482	0.733099	0.613521	2822	0.240492	667	113.9
1970 - 3	153	241385	0.741544	0.631256	2054	0.301775	597	110.7
1970 - 3	116	129287	0.662166	0.628983	1014	0.300518	254	111.1
1970 - 3	98	85508	0.692448	0.635851	814	0.320261	188	109.9
1970 - 3	105	75464	0.721326	0.626165	634	0.403846	233	111.6
1970 - 3	46	28063	0.673321	0.634120	368	0.589744	61	110.2
1970 - 4	144	322891	0.771945	0.617728	10566	0.217852	371	116.2
1970 - 4	81	242652	0.777087	0.637478	9263	0.163306	539	112.6
1970 - 4	87	130136	0.696146	0.633539	4191	0.285246	367	113.3
1970 - 4	47	86226	0.703936	0.642039	2930	0.198312	141	111.8
1970 - 4	66	76476	0.755066	0.632423	1563	0.381503	280	113.5
1970 - 4	20	28268	0.714413	0.638612	1079	0.338983	77	112.4

AUSTRALIA (continued)

YEAR-QTR	EA	TP	WC	WM	U	QARA	IA	CPI
1971 - 1(N)	184	334300	0.721465	0.654855	3533	0.207910	593	117.4
1971 - 1(V)	237	243919	0.733209	0.676165	3125	0.331933	623	113.7
1971 - 1(Q)	136	130985	0.657689	0.667941	2364	0.268245	379	115.1
1971 - 1(S)	159	86944	0.674934	0.680957	1371	0.429730	255	112.9
1971 - 1(W)	118	77488	0.720383	0.669686	1163	0.323288	251	114.8
1971 - 1(T)	33	28473	0.657244	0.679152	335	0.434210	80	113.2
1971 - 2	187	335709	0.773459	0.641736	3648	0.216435	731	119.8
1971 - 2	203	245187	0.791567	0.667361	3293	0.359929	786	115.2
1971 - 2	156	131833	0.703072	0.655973	1478	0.411609	214	117.2
1971 - 2	103	87661	0.710572	0.666204	1348	0.325949	183	115.4
1971 - 2	86	78501	0.771478	0.660481	1188	0.359833	282	116.4
1971 - 2	31	28678	0.737347	0.670855	498	0.387500	88	114.6
1971 - 3	207	335091	0.749392	0.623520	3740	0.268831	704	123.3
1971 - 3	178	245049	0.784116	0.659914	3088	0.228205	595	116.5
1971 - 3	143	132051	0.695798	0.646050	1333	0.414493	329	119.0
1971 - 3	92	87731	0.727039	0.659914	1258	0.313993	131	116.5
1971 - 3	89	79003	0.790102	0.655973	976	0.332090	252	117.2
1971 - 3	36	28680	0.702146	0.659914	570	0.409091	64	116.5
1971 - 4	143	334473	0.792063	0.610159	15109	0.186441	569	126.0
1971 - 4	165	244911	0.804511	0.642272	12514	0.261076	436	119.7
1971 - 4	90	132269	0.733718	0.633800	4959	0.255682	272	121.3
1971 - 4	69	87801	0.743073	0.645508	4066	0.265385	155	119.1
1971 - 4	49	79505	0.796280	0.638008	2594	0.231132	233	120.5
1971 - 4	35	28282	0.745536	0.639069	1588	0.636364	61	120.3
1972 - 1	336	333855	0.725344	0.710369	6922	0.227642	731	127.3
1972 - 1	338	244773	0.734051	0.749213	5148	0.291883	771	120.7
1972 - 1	163	132487	0.682708	0.737602	3037	0.266340	318	122.6
1972 - 1	188	87871	0.691348	0.752329	2141	0.416851	214	120.2
1972 - 1	127	80007	0.744563	0.742447	1882	0.334211	255	121.8
1972 - 1	46	28684	0.689326	0.747974	684	0.582278	72	120.9
1972 - 2	290	333237	0.780545	0.720856	6638	0.238487	721	128.5
1972 - 2	230	244635	0.771944	0.759885	4566	0.262258	674	121.9
1972 - 2	152	132707	0.737055	0.749434	1916	0.376238	414	123.6
1972 - 2	137	87939	0.738233	0.764905	2317	0.359580	228	121.1
1972 - 2	146	80507	0.764419	0.752478	1864	0.459119	277	123.1
1972 - 2	32	28688	0.745902	0.759262	781	0.405063	70	122.0

AUSTRALIA (continued)

YEAR-QTR	EA	TP	mC	WM	[illegible]	QARA	IA	CPI
1972 - 3(N)	283	333838	0.760253	0.710898	5575	0.271073	697	130.3
1972 - 3(V)	203	245325	0.798244	0.749434	4101	0.235226	539	123.0
1972 - 3(Q)	103	133268	0.740770	0.743419	1333	0.255583	354	124.6
1972 - 3(S)	142	88236	0.727542	0.753089	2295	0.487972	189	123.0
1972 - 3(W)	119	81225	0.761218	0.742227	1776	0.411765	271	124.8
1972 - 3(T)	56	28846	0.729335	0.750648	755	0.400000	101	123.4
1972 - 4	130	334439	0.810367	0.701742	19135	0.171278	741	132.0
1972 - 4	121	246015	0.841500	0.741040	13329	0.152393	508	125.0
1972 - 4	78	133829	0.777251	0.731674	4691	0.205263	314	126.6
1972 - 4	60	88533	0.771320	0.745213	5561	0.307692	226	124.3
1972 - 4	96	81943	0.790104	0.739266	2759	0.350365	266	125.3
1972 - 4	36	29004	0.787370	0.740448	1940	0.455696	82	125.1
1973 - 1	378	335040	0.747400	0.743313	5798	0.284424	1	134.6
1973 - 1	395	246705	0.760263	0.782864	4278	0.386497	1	127.8
1973 - 1	161	134390	0.715210	0.773184	1980	0.295956	1	129.4
1973 - 1	193	88830	0.714961	0.787795	1622	0.360748	1	[illegible].0
1973 - 1	171	82661	0.751956	0.782864	1533	0.414044	1	127.8
1973 - 1	52	29162	0.684706	0.784706	723	0.342105	1	127.5
1973 - 2	315	335640	0.806196	0.776369	5035	0.323077	1	138.8
1973 - 2	264	247393	0.813303	0.814512	3848	0.301026	1	132.3
1973 - 2	136	134950	0.770724	0.804780	1677	0.372603	1	133.9
1973 - 2	119	89128	0.757299	0.818845	1664	0.432727	1	131.6
1973 - 2	117	83377	0.796043	0.820091	1471	0.390000	1	131.4
1973 - 2	57	29320	0.769113	0.823853	771	0.553398	1	130.8
1973 - 3	197	336996	0.779320	0.747814	4070	0.290990	1	144.1
1973 - 3	204	248617	0.820175	0.787719	2794	0.353553	1	136.8
1973 - 3	116	135558	0.746772	0.773027	963	0.372990	1	139.4
1973 - 3	95	89483	0.768498	0.789450	1393	0.409483	1	136.5
1973 - 3	108	84054	0.806248	0.801786	810	0.426877	1	134.4
1973 - 3	23	29464	0.751479	0.797041	646	0.348485	1	135.2

APPENDIX TABLE 4.1 REGRESSION ANALYSIS: ENLISTMENT SUPPLY, AUSTRALIA, quarterly, 1966(3)-1973(4).

Variable	Coefficient (t-statistic)							
	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7	Equation 8
Dependent Variable	LERA	LERA	LERD	LERD	LERA	LERA	LERD	LERD
LWR	-0.2703	-0.0929	0.2509	0.2008				
	(-0.4749)	(-0.1295)	(0.3251)	(0.2232)				
LWC					-0.9514	-0.7081	0.1317	0.0091
					(-0.6851)	(-0.4451)	(0.0751)	(0.0049)
LWM					0.0881	-0.0222	-0.2996	-0.2852
					(0.1297)	(-0.0275)	(-0.3109)	(-0.2548)
LUR	0.3431	0.3576	0.1743	0.1634	0.3723	0.3846	0.1862	0.1832
	(2.2104)	(2.0453)	(1.0062)	(0.8545)	(2.2400)	(2.0600)	(0.8329)	(0.7424)
LQARA/D	1.1239	1.1367	0.9336	0.9348	1.0727	1.0871	0.9315	0.9316
	(5.2019)	(4.6376)	(5.4805)	(5.1846)	(4.4230)	(3.7730)	(5.2744)	(4.9859)
LIRA	0.0201	0.0154	0.0032	0.0057	0.0172	0.0144	0.0022	0.0042
	(1.4274)	(0.9505)	(0.1793)	(0.2833)	(1.0968)	(0.7968)	(0.1044)	(0.1773)
LPO	-0.0013	0.0301	0.0415	0.0239	-0.1681	-0.1125	0.0002	-0.0438
	(-0.0046)	(0.1004)	(0.1397)	(0.0746)	(-0.4091)	(-0.2564)	(0.0004)	(-0.0673)
LRPRA	0.0129	0.0055			0.0543	0.0426		
	(0.0898)	(0.0365)			(0.3299)	(0.2450)		
S1	0.0607	0.0637	0.1172	0.1184	0.0572	0.0625	0.1178	0.1196
	(1.1441)	(1.0057)	(1.3077)	(1.2274)	(1.0421)	(0.9499)	(1.2770)	(1.1984)
S2	-0.5357	-0.5612	-0.4630	-0.4366	-0.5649	-0.5853	-0.4741	-0.4552
	(-2.8393)	(-2.6800)	(-1.9425)	(-1.5786)	(-2.8310)	(-2.6341)	(-1.7416)	(-1.4468)
S3	0.1666	0.1716	0.1965	0.2403	0.1260	0.1427	0.1882	0.2296
	(2.7595)	(1.2218)	(2.0372)	(1.4764)	(1.2922)	(0.8888)	(1.2721)	(1.1757)
LGLERA/D		-0.0036		0.0709		0.0084		0.0751
		(-0.0195)		(0.3651)		(0.0439)		(0.3757)
CONSTANT	1.0800	1.0255	1.9573	1.8804	4.9025	4.2451	2.6693	3.0435
	(1.5703)	(1.2999)	(3.9965)	(3.1666)	(0.6805)	(0.5463)	(0.2954)	(0.3205)
R^2	0.9296	0.9176	0.8806	0.8709	0.9307	0.9183	0.8807	0.8710
D-W	1.4161	1.3757	1.8453	1.7879	1.4563	1.4112	1.8452	1.7887
N	29	28	29	28	29	28	29	28

APPENDIX TABLE 4.2. REGRESSION ANALYSIS: ENLISTMENT SUPPLY, GREAT BRITAIN, quarterly, 1966(3)-1973(3).

Variable	Coefficient (t-statistic)							
	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7	Equation 8
Dependent Variable	LERA	LERA	LERD	LERD	LERA	LERA	LERD	LERD
LWR	-1.5190	-1.4367	-1.5788	-1.5688				
	(-2.2590)	(-2.1246)	(-1.9512)	(-1.8424)				
LWC					-1.1501	-0.5829	-1.7263	-1.9937
					(-0.8437)	(-0.3894)	(-1.3282)	(-1.3874)
LWM					1.4604	1.2982	1.5939	1.6249
					(2.0472)	(1.7929)	(1.9093)	(1.8426)
LUR	0.9048	1.0584	0.7933	0.6098	0.8989	1.0546	0.8028	0.6481
	(3.8274)	(3.5508)	(2.9502)	(1.9333)	(3.6928)	(3.4890)	(2.8797)	(1.3218)
LQARA	0.7938	0.8308			0.8121	0.8703		
	(4.7047)	(4.8644)			(4.4760)	(4.6865)		
LADRA	-0.0692	-0.0775			-0.0602	-0.0606		
	(-1.0047)	(-1.0935)			(-0.7816)	(-0.7877)		
ETDV	0.0836	-0.0860	-0.0672	-0.0814	-0.1058	-0.1376	-0.0584	-0.0480
	(-0.9446)	(-0.9165)	(-0.6844)	(-0.8665)	(-0.8844)	(-1.1075)	(-0.4801)	(-0.3730)
S1	0.0493	0.0584	0.2379	0.2316	0.0377	0.0360	0.2372	0.2285
	(0.6799)	(0.7865)	(4.2619)	(3.8999)	(0.4502)	(0.4317)	(4.1315)	(3.7334)
S2	-0.3698	-0.3224	-0.1505	-0.2009	-0.3739	-0.3310	-0.1517	-0.2021
	(-5.4011)	(-4.2397)	(-1.9469)	(-2.0324)	(-5.2316)	(-4.2124)	(-1.9042)	(-1.9927)
S3	0.0070	0.0564	0.0964	-0.0566	-0.0109	-0.0675	-0.0976	-0.0608
	(-0.0740)	(-0.5728)	(-1.0439)	(-0.5563)	(-0.1110)	(-0.6119)	(-1.0286)	(-0.5812)
LGLERA/D		-0.1654		0.2805		-0.1735		0.2055
		(-1.2858)		(1.0282)		(-1.3136)		(0.9839)
CONSTANT	-1.9683	-2.3662	-2.3727	-1.9272	-3.4026	-5.6672	-1.7188	-0.0856
	(-2.3857)	(-2.5819)	(-2.5694)	(-2.0344)	(-0.7407)	(-1.0587)	(-0.3803)	(-0.0166)
R^2	0.9550	0.9586	0.8879	0.8898	0.9552	0.9596	0.8880	0.8907
D-W	1.4154	1.0000	1.7232	1.9711	1.4384	1.0339	1.7151	1.9734
N	28	27	28	27	28	27	28	27

APPENDIX TABLE 4.3 REGRESSION ANALYSIS: ENLISTMENT SUPPLY, UNITED STATES, quarterly, 1966(3)-1974(1)

Variable	Coefficient (t-statistic)							
	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7	Equation 8
Dependent Variable	ERA	ERA	ERD	ERD	ERA	ERA	ERD	ERD
WR	-0.0035	-0.0074	-0.0185	-0.0106				
	(-1.0567)	(-3.4646)	(-2.7167)	(-1.6273)				
WC					0.0002	0.0002	-0.0004	0.0006
					(0.7267)	(0.6859)	(-0.4552)	(0.8305)
WM					0.00001	0.00002	0.0001	0.00002
					(0.4115)	(1.0241)	(2.1112)	(0.4679)
UR	-0.0216	0.0246	-0.0821	-0.0942	-0.0149	0.0133	-0.0820	-0.0743
	(-1.2131)	(1.9266)	(-1.8537)	(-2.5460)	(-0.7621)	(0.8142)	(-1.6966)	(-1.9562)
QARA/D	0.0136	0.0154	0.1434	0.0961	0.0132	0.0135	0.1432	0.0884
	(3.2541)	(3.0974)	(24.5433)	(4.7662)	(3.3386)	(3.0121)	(24.6605)	(4.2332)
IRA/D	0.5246	0.5844	0.3614	0.5482	0.5205	0.5396	0.4151	0.5708
	(5.0150)	(4.6199)	(0.9642)	(1.4153)	(4.9076)	(4.4322)	(1.0984)	(1.4908)
PO	0.0039	0.0047	0.0195	0.0207	0.0046	0.0054	0.0155	0.0277
	(0.8770)	(1.5063)	(1.5939)	(1.7909)	(1.0289)	(1.1127)	(1.1029)	(2.7699)
S1	0.0012	0.0036	0.0012	0.0009	0.0010	0.0025	0.0017	0.0003
	(2.7574)	(5.0794)	(0.7857)	(0.6647)	(1.7415)	(2.9333)	(0.8919)	(0.1772)
S2	0.0019	0.0025	0.0020	0.0028	0.0019	0.0023	0.0023	0.0028
	(4.2019)	(4.1827)	(1.2258)	(1.8443)	(4.0548)	(3.8507)	(1.3591)	(1.8536)
S3	0.0027	0.0024	0.0045		0.0029	0.0027	0.0042	0.0063
	(6.3149)	(4.1763)	(3.1112)		(6.1249)	(4.9659)	(2.5876)	(3.9334)
LGERA/D		0.5700		-0.1128		0.3461		-0.1097
		(4.1635)		(-2.3982)		(2.2544)		(-2.8996)
CONSTANT	0.0084	-0.0023	0.0154	0.0207	-0.0197	-0.0266	0.0281	-0.0609
	(2.1612)	(-0.7783)	(1.7121)	(2.8817)	(-0.6236)	(-0.9016)	(0.3078)	(-0.7899)
R^2	0.8982	0.8951	0.9815	0.8923	0.9017	0.8965	0.9823	0.9000
D-W	1.7473	1.8946	1.7370	1.2105	1.7457	2.0017	1.7222	1.2366
N	30	29	30	29	30	29	30	29

APPENDIX TABLE 4.4. REGRESSION ANALYSIS: ENLISTMENT SUPPLY, CANADA, annual, 1969-1973.

Variable	Coefficient (t-statistic)	
	Equation 1	Equation 2
Dependent Variable	LERD	LERD
LWR	-0.9889 (-0.3076)	
LWC		-3.6004 (-0.8427)
LWM		1.3739 (0.3054)
LUR	-0.2872 (-0.7763)	-0.0048 (-0.0124)
LQARD	0.9613 (5.7597)	1.0878 (6.2598)
SM	0.8516 (1.1950)	0.3456 (0.3663)
SQ	0.3654 (1.2901)	0.2009 (0.5529)
SC	-0.0949 (-0.5991)	0.0817 (0.4218)
CONSTANT	-6.2480 (-1.7868)	-0.8624 (-0.1946)
R^2	0.9750	0.9847
D-W	2.7276	2.2302
N	19	19

APPENDIX TABLE 4.5. REGRESSION ANALYSIS:
ENLISTMENT SUPPLY, AUSTRALIA, QUARTERLY BY STATE, 1966(3)-1973(3)

Variable	Coefficient (t-statistic)	
	Equation 1	Equation 2
Dependent Variable	LERA	LERA
LWR	-1.4776 (-5.5842)	
LWC		-1.1868 (-4.6009)
LWM		2.4410 (7.4437)
LUR	0.1607 (1.0208)	0.1788 (1.6280)
LQARA	0.8598 (10.0650)	0.8991 (11.0830)
LIRA	-0.0049 (-0.4639)	0.0371 (2.7166)
S1	0.0175 (0.3516)	0.0088 (0.1872)
S2	-0.0095 (-0.1844)	-0.0137 (-0.2814)
S3	0.0045 (0.0877)	0.0005 (-0.0112)
SN	-6.0057 (-23.4720)	-5.3808 (-19.3470)
SV	-6.0585 (-25.2890)	-5.4687 (-20.9580)
SQ	-5.9747 (-26.3130)	-5.3565 (-21.0840)
SS	-5.8503 (-27.0400)	-5.2408 (-21.4320)
SW	-5.8891 (-25.4680)	-5.3231 (-21.1670)
ST	-6.0436 (-29.4910)	-5.4368 (-23.1110)
R^2	0.5583	0.6086
N	174	174

DATA APPENDIX: CHAPTER 5.

Education and Marriage Effects of the Draft.

Data Sources and Notes

AUSTRALIA.

1. Marriage: annual, 1962-1973.

The marriage rate was grooms under 21 years of age as a proportion of the population of males aged 17-20. Both series were from Commonwealth Bureau of Census and Statistics, Demography, annual. The induction rate was annual inductions into the military as a proportion of twenty year old males, the draft-age group. Induction data were provided by the Directorate of Manning, Army Headquarters, Canberra, (September 1972 and November 1974) and the population base was from Demography. The population figures were at June. The Vietnam Dummy Variable was set at 1 for 1966-1971, the years of Australian conscript troop presence in Vietnam.

2. Education: quarterly, 1964(1) - 1974(1).

The education participation rate was given by total school enrollments, all males, as a proportion of all males not in the labor force. This was available as a proportion and given in Commonwealth Bureau of Census and Statistics, The Labour Force, quarterly. (No age-specific education statistics are published for tertiary education in Australia, and the annual tertiary enrollment figures given in Commonwealth Bureau of Census and Statistics, University Statistics, were not accessible in the United States.)

UNITED STATES

1. Marriage: quarterly, 1962(1) - 1966(4).

The marriage rate was number of bridegrooms aged 18-24 per 1000 of the total male population 18-24, as provided by National Center for Health Statistics, Vital Statistics of the United States, annual. Only states meeting federal statistical requirements were included in the marriage series, and the proportion of national population of 18-24 year old males so covered ranged from 62 percent in 1962(1) to 76 percent in 1966(1). The number of marriages was extrapolated in proportion to the population of the states involved to derive a total U.S. figure.

The induction rate used the same population base as the marriage rate, and inductions were obtained from Department of Defense, Selected Manpower Statistics, 1974. The Marriage Dummy Variable was set at one for the period 1963(3) to 1965(3).

2. Education: annual, 1946-1973.

The education participation rate is first time enrollments in college, males aged 18-24 as a proportion of the total population of males aged 18-24. The enrollment statistics are from Department of Health, Education and Welfare, Digest of Educational Statistics, 1973, and the population base is from Vital Statistics of the United States, annual.

The induction and casualty figures are from Department of Defense, Selected Manpower Statistics, 1974, with inductions related to the population base of 18-24 year old males and casualties related to total army force strength, the latter also from Selected Manpower Statistics. Casualties refer only to battle deaths. The Student Deferment Dummy Variable is set at one from 1952, when deferments were first initiated, through to 1973 when the draft ended.

NOTES

NOTES

Chapter 1.

Introduction: Institutional and Historical Background

1. Seymour Melman, "The Peaceful World of Economics I," Journal of Economic Issues, March 1972, pp. 35-41.

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3. Roy Forward, Military Manpower Procurement in 142 Countries, unpublished manuscript, University of Queensland, Brisbane, Australia, 1970.

4. For reviews of the military compensation system see: Harry J. Gilman, "Military Manpower Utilisation," in S. Enke (ed.) Defense Management, Englewood Cliffs, N.J.: Prentice Hall, 1967, pp. 246-266, and Stephen L. Canby, Military Manpower Procurement: A Policy Analysis, Lexington, Mass: D. C. Heath, 1972, Chapter 5. Major official reports on military pay structure have been: Department of Defense, (U.S.), Modernizing Military Pay, (Hubbell Report), Washington, November 1967; National Board for Prices and Incomes, (U.K.), Standing Reference on the Pay of the Armed Forces, Report Nos. 70 and 116, London, 1968, 1969; Department of Defence, (Australia), Final Report of the Committee of Inquiry into Financial Terms and Conditions of Service for Male and Female Members of the Regular Armed Forces, (Kerr-Woodward Report), Canberra, 1972.

5. R. G. Menzies, The Measure of the Years, Melbourne: Cassell, 1970, p. 75.

6. Report of the President's Commission on an All-Volunteer Armed Force (Gates' Report), Washington, 1970, p. 169.

7. Colin S. Gray, Canadian Defence Priorities: A Question of Relevance, Toronto: Clarke, Irwin & Co., 1972.

8. Gwynn Harries-Jenkins, "From Conscription to Volunteer Armies", in Force in Modern Societies: The Military Profession, Adelphi Papers, No. 103, International Institute for Strategic Studies, London, Winter 1973, p. 11. See too J. van Doorn, The Decline of the Mass Army: Sociological Essays, London: Sage, 1974.

9. For a thorough review of the growing field of study of non-violent action see Gene Sharp, The Politics of Non-violent Action, Boston: Porter Sargent, 1973.

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1. For an argument that the procurement system may affect the level of defense chosen by the collectivity, see Richard E. Wagner, "Conscription, Voluntary Service and Democratic Fiscal Choice," in J.M. Buchanan and R.D. Tollison (editors), Theory of Public Choice: Political Application of Economics, Ann Arbor: University of Michigan Press, 1972, pp. 136-153.

2. For a proposal that Congress directly authorize troop strengths, see Committee of Economic Development, Military Manpower and National Security, New York, 1972, pp. 23-30.

3. Kenneth V. Greene and Daniel H. Newlon, "The Pareto Optimality of a Lottery Draft," Quarterly Review of Economics and Business, Winter 1973, pp. 61-70.

4. J.K. Galbraith, cited by J.F. Horton et. al., How to End the Draft, Washington: The National Press, 1967, p. 42.

5. Robert D. Tollison, "The Political Economy of the Military Draft," Public Choice, Fall 1970. Reprinted in J.M. Buchanan and R.D. Tollison (editors), Theory of Public Choice: Political Applications of Economics, Ann Arbor: University of Michigan Press, 1972, pp. 302-314. Citations refer to the latter.

6. Robert Tollison, pp. 310, 313.

7. For illustrative discussion of military attitudes toward conscription see for the U.S.: Milton Friedman, "Volunteer Armed Force: Failure or Victim?" Newsweek, February 11, 1974, p. 82; for Australia: A.J. Forbes, Commonwealth Parliamentary Debates, House of Representatives, 16 November 1964, p. 2896; for Great Britain: Royal United Service Institution, Mobilisation of Youth: Voluntary Service or Conscription? London: R.U.S.I., 1970; and for Canada, Department of National Defence, Report of the Minister's Manpower Study (Men), Ottawa: Canadian Forces Headquarters, 1966, pp. 55-56.

8. See Tables 2.1 and 2.2 below. Also, see Chapter 4, Table 4.2 for British poll evidence.

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10. A discussion of vote-trading possibilities is given in Kenneth V. Green and Daniel H. Newlon, "Economic Factors Affecting the Likelihood of a Switch to a Volunteer Army," Public Finance Quarterly, October 1973, pp. 388-398.

11. Actually simple majority voting was qualified to the extent that a majority in 4 of the 6 states was also required. The referenda were defeated under both counts, so we can proceed as if unqualified majority voting applies.

12. For an exampl which establishes the "law of demand" from random behavior rather than the usual utility maximisation approach see Gary S. Becker, "Irrational Behavior and Economic Theory," Journal of Political Economy, February 1962, pp. 1-13.

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14. Glenn A. Withers, Conscription: Necessity and Justice, Sydney: Angus & Robertson, 1972, p.8.

15. Robert Tollison, pp. 312-313.

Chapter 3. Manpower Requirements Under Alternative Procurement Systems

1. For an elaboration of such a programming approach, though directed specifically at problems for large bureaucratic companies, see C.J. Purkiss, "Approaches to Recruitment, Training and Redeployment Planning in an Industry," In N.A.B. Wilson, (ed.), Manpower Research, London: English Universities Press, 1969, pp. 67-81; and C.J. Purkiss, "Models for Examining and Optimizing Manpower Deployment," in A.R. Smith, (ed.) Models of Manpower Systems, New York: American Elsevier, 1971, pp. 265-284.

2. Robert Dorfman, "Econometric Analysis for Assessing the Efficacy of a Public Investment." Proceedings of the Study Week (October 1963), Le Role de l'Analyse Econometrique dans la Formulation de Plans de Developpement, Pontifical Academy of Sciences, Vatican City, 1965, pp. 187-205.

3. Theo Sommer, "Committee Discussions on the Future of Military Force in Modern Societies: Report to the Conference," in Force in Modern Societies: The Military Profession, International Institute for Strategic Studies, London, Adelphi Paper No. 133, Winter 1973, p. 33. Also see M. Olsen & R. Zeckhauser, "Collective Goods, Comparative Advantages and Alliance Efficiency," in R.N. McKean (ed.), Issues in Defense Economics, (New York: NBER, 1967), pp. 26-48.

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8. See D.J. Bartholomew, "Renewal Theory Models for Manpower Systems," in N.A.B. Wilson, pp. 120-128.

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Chapter 4. Military Manpower Supply.

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9. See, for instance, G.W.Ladd, "Regression Analysis of Seasonal Data," Journal of the American Statistical Association, June 1964.

10. See J. Johnston, Econometric Methods, Second Edition, New York: McGraw Hill, pp. 262-263, 303-320.

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18. For details of the working of Selective Service system allocation of calls see Anthony C. Fisher, The Supply of Enlisted Volunteers for Military Service, Doctoral Dissertation, Columbia University, 1968, Appendix B, pp. 72-74.

19. Commonwealth Parliamentary Debates, House of Representatives, (Australia), 25 August 1971, p. 739 and 30 August 1972, p. 985.

20. Ernie Lightman, p. 216.

21. Jerome, Johnston and Jerald G. Bachman, Young Men and Military Service, (Youth in Transition Series, Volume V) Ann Arbor, Michigan: Institute for Social Research, 1972, pp. 101-130.

22. Report of the President's Commission on an All-Volunteer Armed Force, Washington: 1970, p.172.

23. Robert E. Hall, "Why is the Unemployment Rate so High at Full Employment?" Brookings Papers, No.3 , 1970 pp. 369-402. Martin S. Feldstein, "The Economics of the New Unemployment" The Public Interest, 1973.

24. A.A.Cook, Jr. "Supply of Air Force Volunteers", and Alan Fechter, "Impact of Pay and Draft Policy on Army Enlistment Behavior" in Studies Prepared for the President's Commission... pp. II-3-1 to II-4-34.

25. Ibid. Also Anthony C. Fisher, "The Cost of the Draft and the Cost of Ending the Draft," American Economic Review, June 1969, pp. 239-254.

Chapter 5 .
Evaluation of Alternative Procurement Systems

1. The Australian estimate is given in Glenn A. Withers, Conscription: Necessity and Justice, Sydney: Angus & Robertson, 1972, p. 93.

2. The American estimate is given in Report of the President's Commission on an All-Volunteer Armed Force, Washington, 1970, p. 29.

3. The theory of the dual labor market is developed in Michael J. Piore, "On-the-Job Training in a Dual Labor Market," in Arnold R. Weber, et al. (eds.), Public-Private Manpower Policies, Madison, Wisconsin: Industrial Relations Research Association, 1969.

4. Charles Killingsworth, "Recent Developments in Labor Market Theory," Paper delivered at the New Manpower Researchers' Conference, George Washington University, October 4, 1974.

5. This presentation borrows from E. F. Renshaw, "The Economics of Conscription," Southern Economic Journal, October 1960, pp. 111-117.

6. One writer who has drawn attention to this monopsony problem is Thomas E. Borcherding, "A Neglected Social Cost of a Voluntary Military," American Economic Review, March 1971, pp. 195-6. See also R. L. Bish and P. D. O'Donoghue "A Neglected Issue in Public Goods Theory: The Monopsony Problem," Journal of Political Economy, November-December 1970, pp. 1367-71; and "Comment" by H. Shibata and "Reply" by Bish and O'Donoghue in Journal of Political Economy, January-February 1973, pp. 223-226.

7. R. N. McKean, "Property Rights Within Government and Devices to Increase Governmental Efficiency," Southern Economic Journal, October 1972, p. 184.

8. W. Lee Hansen and Burton Weisbrod, "Economics of the Military Draft," Quarterly Journal of Economics, August 1967, p. 403; J. Ronnie Davis and Neil A. Polomba, "On the Shifting of the Military Draft as a Progressive Tax-in-Kind," Western Economic Journal, March 1968, p. 150.

9. Larry A. Sjaastad and Ronald W. Hansen, "The Conscription Tax: An Empirical Analysis," Studies Prepared for the President's Commission on an All-Volunteer Armed Force, Washington, 1970, pp. IV-1-1 to IV-1-64.

10. The adjustment was made by first calculating minimum supply price welfare loss as a proportion of gross tax subsidy value of conscription, using a formula derived as for equation (3), i.e.,

$$\frac{MSWP}{(w_2-w_1)L_2} = 1/2 - {}^{L_1}/_{2L2}$$

where L_1 was the number of true volunteers and L_2 the required total force strength. MSPW is the welfare loss to be calculated, and $(w_2-w_1)L_2$ is the gross subsidy, found where w_1 is the prevailing military wage and w_2 is the increase necessary to provide L2, assuming a constant wage elasticity of supply. The estimates of the relevant variables are those given in Sjaasted and Hansen, updated to 1970 prices.

11. For a formal proof of this see Kenneth V. Greene and Daniel H. Newlon, "The Pareto Optimality of Eliminating a Lottery Draft," Quarterly Review of Economics and Business, Winter 1973, pp. 61-65.

12. Based on a random sample of 200 male students at La Trobe University, Australia, conducted by this writer in June 1970.

13. Stephen L. Canby, Military Manpower Procurement: A Policy Analysis, Lexington, Mass.: D. C. Heath, 1972, p. 92.

14. Quoted in H. A. Marmon, The Case Against a Volunteer Army, Chicago: Quadrant Books, 1971, p. 21.

15. Federal marriage statistics are given only for states meeting federal statistical requirements. These states represented 75 percent of total population as of 1966 and the marriage statistics have been extended pro rata for a total U.S. estimate of absolute number of marriages. See Data Appendix.

16. Gary S. Becker, "A Theory of Marriage: Part I", The Journal of Political Economy, July/August 1973, pp. 813-846.

"A Theory of Marriage: Part II", The Journal of Political Economy, March/April 1974, Supplement, pp. S11-S26.

17. Sjaasted & Hansen, IV-1-29 to IV-1-32.

18. Paul A. Weinstein, "Occupational Crossover and Universal Military Training," in Sol Tax (ed.), The Draft: A Handbook of Facts and Alternatives, Chicago: University of Chicago Press, 1967, p. 24.

19. For a survey of much of the available evidence see David B. Kassing, "Military Experience as a Determinant of Veterans' Earnings," in Studies Prepared for the President's Commission on an All-Volunteer Armed Force, Washington, 1970, Volume II, pp. III-8-1 to III-8-22.

20. Desmond P. Wilson and Jessie Horack, "Military Experience as a Determinant of Veterans' Attitudes," in Studies Prepared for the President's Commission on an All-Volunteer Armed Force, Washington, 1970, Volume II, pp, III-7-1 to III-7-27.

21. R. Parrish and M. Weisser, "Paying the Soldier His Hire. The Economics of Abolishing Conscription," Current Affairs Bulletin, (Sydney), July 27, 1970, pp. 72-3.

22. Sjaasted and Hansen, pp. IV-1-3

23. Sjaasted and Hansen; and Report of the President's Commission . . . pp. IV-1-3

24. The more recent estimates by Knapp employ only the financial burden conception of the tax, and use the military wage as of September 1971 to estimate that burden. The September 1971 wage however reflected the major military pay increases which were part of the movement to all-volunteer forces. It is inappropriate to use such a market-oriented wage for anything other than a transitional burden for draftees, let alone in human capital steady state analysis as Knapp implies. J. H. Knapp, "A Human Capital Approach to the Burden of Military Draft," Journal of Human Resources, Fall 1973, pp. 485-496.

25. These calculations are made for the representative year 1970 and represent the calculated total implicit taxes divided by the associated number of servicemen. These figures are given in the text above. Regular (explicit) income tax obligations are evaluated at the 1970 prevailing rates, as given in the Commonwealth Year Book 1970. Adjustment is made for the tax advantage of in-kind military income.

26. Report of the President's Commission. . . .p. 26.

27. Mark V. Pauly and Thomas D. Willett, On the Distinction Between 'Ex Post' and 'Ex Ante" Equity, Harvard Institute of Economic Research Discussion Paper No. 153, December 1970, p. 3. See also Thomas D. Willett, "Another Cost of Conscription," Western Economic Journal, December 1968, pp. 425-426.

28. Richard M. Nixon, "The All-Volunteer Armed Force," Radio Address, 17 October 1968; reproduced in Marmion, p. 77.

29. Greene and Newlon, pp. 67-68.

30. See Davis and Palomba, pp. 150-153, for analysis of the draft as a progressive tax-in-kind, through this shifting or avoidance effect.

31. Eli Ginzberg, "The Case for a Lottery" The Public Interest, Fall 1966, pp. 83-39.

32. See the discussion of quality of personnel under alternative procurement systems in Chapter 2.

33. The year of highest casualties during the Vietnam War for Australia was 1968. In that year the death rate for Australian servicemen under 25 was 0.0019, from all causes. The death rate for civilians of the same age was 0.0021. Source: Commonwealth Bureau of Census and Statistics, Demography, 1968. For U.S. details see Stephen L. Canby, pp. 63-72.

34. For an application employing Rawls' principles of justice see Glenn Withers, pp. 102-152.

35. Commonwealth Parliamentary Debates, (House of Representatives), 11 April ,1972, p. 1446.

36. A.D. McGuarr, Conscription and Australian Military Capability, Canberra Papers on Strategy and Defense, No. 11, Canberra: A.N.U. Press, 1971, p. 22.

37. 'Review of the Administration and Operation of the Selective Service System,' Hearings before the Committee on Armed Services, House of Representatives, 89th U.S. Congress, 2nd Session, June 22-30, 1966, p. 9714.

38. Milton Friedman, "Volunteer Armed Force: Failure or Victim?," Newsweek, February 11, 1974, p. 82.

39. D.P. Wilson and J. Horack, "Military Recruitment and Militarism in Latin America, in Studies prepared for the Presidents Commission ...., Volume II, pp. III-5-1 to III-5-21.

40. Preface to Thomas Reeves and Karl Hess, The End of the Draft, New York: Vintage Books, 1970, p. xvi.